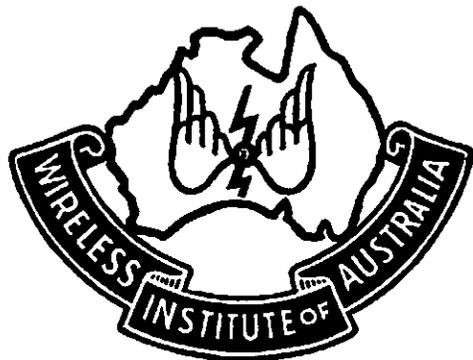


SIXPENCE

JANUARY 1942

AMATEUR RADIO

THE
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AMATEUR RADIO

No. 12

January, 1942.

AUTOMATIC DIRECTION FINDING

- From an article by Ralph Gibbons in QST -

A device called the radio compass was introduced to air navigation in about 1932. The principle of this device briefly is as follows:- If both a loop antenna and a vertical (non-directional) antenna are connected to a receiver through suitable coupling networks, the resulting field pattern is a cardioid (fig. 1a).

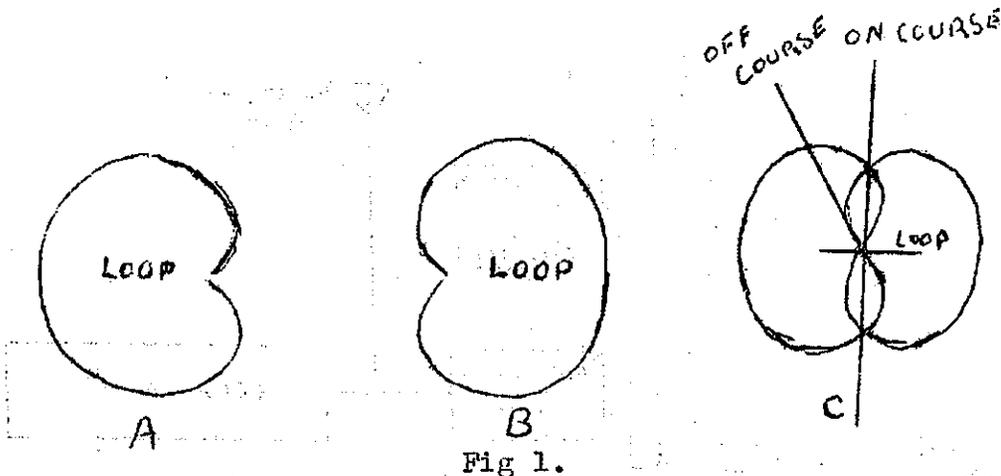


Fig 1.

If the connections to the loop are reversed, the pattern will be as in fig. 1B. i.e. the maximum signal will now come in along the line that previously gave minimum response.

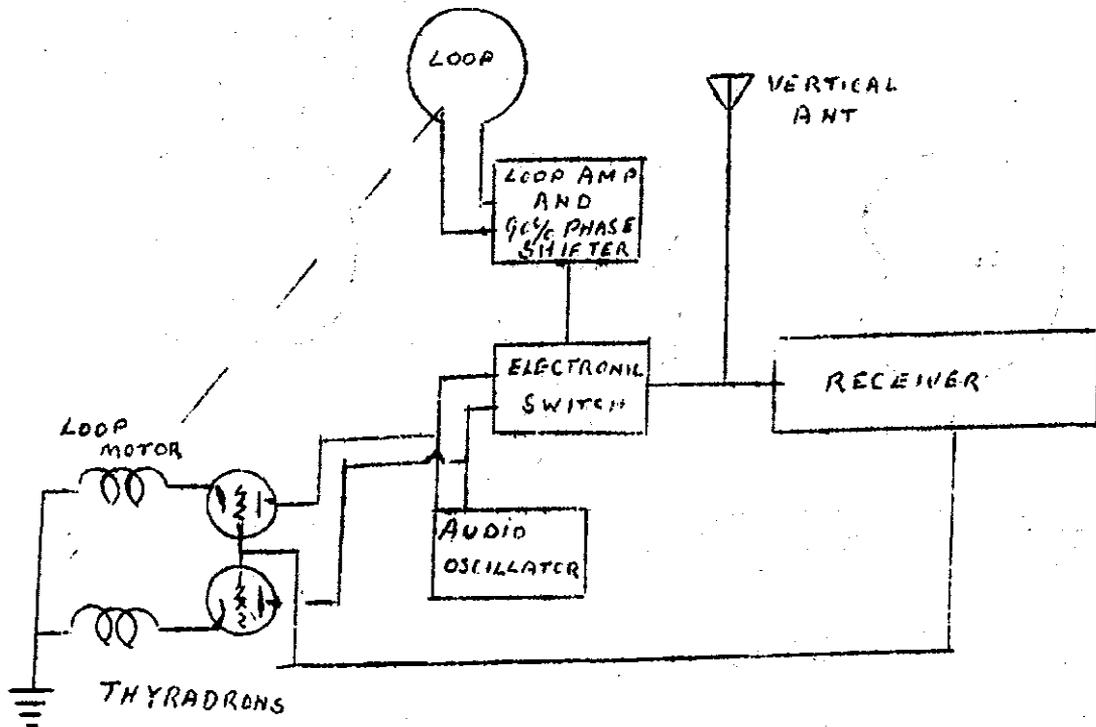
The radio compass consisted of a receiver to which was connected a zero-center output meter and electronic switching for simultaneously reversing the polarity of the meter and of the loop antenna. If the radio station were located directly ahead, reversing the loop connections would not increase or decrease the amount of receiver output and hence the needle

would not deflect (fig. 10). If, however, the station were located to right or left, the pickup would be greater with one loop connection than the other and the needle would deflect in the corresponding direction. This device would let a pilot know if he was headed for the station but could not fix his position.

A few years ago someone conceived the idea of adding electrical contacts (in effect) to either side of the loop movement, these contacts in turn to close the circuits of an electric motor that would rotate the loop. The position of the loop could then be indicated on an azimuth scale. Thus, if the station is to the right or left of the plane, when the signal is tuned in the loop will rotate until the meter is returned to zero, and the position of the loop gives the bearing of the radio station from the plane.

This device as contrasted with the radio compass is extremely useful to the pilot. By tuning in two stations he can obtain crossed bearings and so fix his position. A better picture of the system can be obtained by referring to Fig. 2.

Essentially it consists of a loop antenna, a loop amplifier and 90° phase shifter, an electronic switch, a non-directional antenna, a sensitive and selective receiver, a thyatron azimuth control circuit and an audio oscillator.



The voltage induced in the loop is maximum when the plane of the loop is turned towards the transmitter and is zero when perpendicular to the line from the transmitter. The resultant of the voltage induced in the loop is 90° and of phase with that induced in the vertical antenna and changes abruptly 180° as the loop is rotated through the position of zero pickup. The voltage from the loop is amplified and shifted through 90° so that it is either in phase with, or in phase opposition to, the voltage induced in the vertical antenna, depending upon which edge of the loop is turned towards the transmitter.

The voltage from the loop amplifier is then fed into the electronic switch stage. The circuit is somewhat similar to a push-pull audio amplifier stage, where two tubes are connected in push-pull with an additional coupling in the common grid return. The output of the loop amplifier is fed into this common grid circuit and the output from an audio oscillator is fed to the grids in push-pull. The result is that depending on the polarity of the voltage from the audio oscillator, one tube amplifies during part of half of the audio cycle and the other tube during part of the other half of the audio cycle. The plates of the two tubes are connected in push-pull through a tuned circuit, and because of the switching action between the two tubes, the phase of the current in this circuit will reverse in accordance with the audio oscillator.

From the electronic switch stage the loop signal is combined with that from the vertical antenna and amplified and dissected in a regular receiver circuit. The output signal from the receiver is impressed in parallel on the grids of the two thyratron tubes used to control the loop motor. The plates of the thyratrons are fed in push-pull by the audio oscillator, and, depending upon which way the loop is turned, the phase relation determines which of the thyratrons will fire and thus which way the loop will turn. When the loop is broadside to the direction of the radio station, the difference or resultant is zero and the motor does not operate. The circuits are arranged so that if the signal is coming from the left, the modulation is such that the indicator points to the left and if the signal is from the right, the pointer turns in that direction.

The accuracy of the signal is excellent under normal conditions, but there are several factors influencing its accuracy under adverse conditions. static has little or no effect except to cause a spurt of a few degrees in one direction or the other but heat lightning, because of its more continuous nature, offers a greater problem. During intense conditions the pointer may tend to swing away from the station and towards the direction of the center of the thermal static agitation under such conditions

automatic operation is usually limited to 40 or 50 miles. Trouble is also experienced in mountainous regions where reflections of the signal take place.

However, the ADF idea has opened new fields in commercial aviation. A new indicator has been released which combines two ADF's that can be tuned to two separate stations within its range. The bearings thus obtained are indicated in a single dial scale through the medium of red and green needles concentrically projecting across the scale face. In operation it is possible to tune in a station ahead of the plane on one direction finder and a station aft of the plane on the second unit, with the bearings indicated by the two colored needles. Thus in flying a straight route between two stations not served directly by radio range courses the plane's position is indicated by the two needles which, with the plane on course, will be separated by 180°. Should the plane deviate from a straight line between the two stations, this fact is immediately and continuously shown by the tendency of the two needles to turn towards each other.

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MEMORIES OF THE PAST

- Some Early Signals With England -

Some of the gang were seated in Air Force House, and of course the conversation gradually drifted around towards Contests and many anecdotes were flying round. In the good old days - that is, before Adolf, this was the time of the year when the xmtr and rx were being tuned for the B.E.R.U., due regard being paid to that Rule that said that the Licensed Power must not be exceeded - well not much anyway. Memories of the manner in which ZC6EC pounded through about 2 p.m., ST6KR in the wee sma hours and the seeming inability of E19J. to hear anyone in the Contest whom he had worked a few days previously and given R8 reports to and the mad scramble to work XZ2DY, brought happy memories and a longing to call TEST BERU once again.

A remark made by one bright spark to the effect that in one Contest he sent "TEST BERU" no "G's" pse "brought many a smile and turned my Memory back to the days when a "G" signal, much less a qso was something that every ham dreamed of and herewith an extract from the "Sydney Morning Herald" of 26/11/24.

"Wireless Amateurs Feat - Messages to England"

"At 4.15 o'clock yesterday morning Mr. Charles Maclurcan of Strathfield and Jack Davis of Vaucluse, well-known wireless amateurs exchanged clear messages in morse code with E.J. Simmonds 20D of Gerards Cross Buckinghamshire England.

They are the first two wireless amateurs in New South Wales to exchange messages with England.

Mr. Maclurcan as President of the Wireless Institute seized the opportunity to send a message to the King. The messages by wireless ran "To His Majesty the King. Greetings from Australian Radio Experimenters. Signed - Maclurcan, President, Wireless Institute."

Last night Mr. Maclurcan achieved another notable triumph. He was able to communicate with an American Amateur 6CGO on his low power set using a power of not more than ten watts. He sent a code word of four letters which was correctly received by the American Amateur and checked back. This was reception was verified by ZDF and a New Zealand Amateur Mr. Bell 4AA.

It was Mr. Davis ZDF who first picked up the English Amateur yesterday morning. He successfully exchanged messages with Mr. Simmonds until 4.50 a.m. Mr. Davis was working his own home-made set with a power of 100 watts. Later Mr. Maclurcan using 250 watts also got into touch with England and was equally successful.

It is not however an Australian record, as a Victorian Amateur was able to communicate with Mr. Simmonds last week.

In their exchanges with England yesterday morning Mr. Maclurcan and Mr. Davis each worked on a wavelength of 86 metres. Mr. Simmonds operated on a wavelength of 96 metres.

Messages were not only received on two valve sets, but at times they were in clear communication with England on one valve."

.....

"LONDON CONFIRMATION"

London,
November 25th.

Mr. Simmonds of Gerrards Cross, a village in Buckinghamshire has received by wireless a message of greeting to King George by Australian Experimenters. This was transmitted by Mr. Chas. Maclurcan of Strathfield, Sydney and was forwarded to His Majesty by Mr. Simmonds."

"T. High."

... SLOUCH HATS & FORAGE CAPS ...

Well, chaps the news this month isn't so good. Can any of you give me some authentic news of either VK2AJB or VK6GR? I am told that we can consider both these as lost, the former while serving with the R.A.F. and the latter with the R.A.N. Any news of them will be very welcome...so let us hope by the next issue I can give you all some better news for the loss of any VK, any Ham for that matter, always seems the loss of a personal friend, such is "the Ham Spirit."

So far, Vic Jarvis VK2JV is the only VK definitely known to be killed. Vic, serving from R.A.A.F.W.R. was lost in first Libyan campaign. Remember the "Nancy Leo and the laddie with the 'uke???.well one of our converted VK merchantmen would have called "CQ DX" when the ship went down, which, luckily, it didn't. The good ship started from VK with the hams represented by VK3IR, but by the time she had reached China VK40J and VK3UH had arrived to lend a hand. The shipper no doubt saw what three hams could do so no doubt that is why they went over to G to pick up DX Hound VK2KS, and from there on "efficiency" was the word from the Wireless Room. Naturally, Anzac traditions have to be upheld so they looked up every Ham organisation that they knew of in any Port touched. In England they had a big newspaper write-up and an invite to the BBC Dinner...guess the BBC are still after that "accent" Hi. Emboldened by this is no doubt the reason that in K6 they called on the FCC and the 2nd RI took them everywhere in his car and to dinner at Waikiki Beach Hotel. They, too, will, as the Yanks now say, Remember Pearl Harbour, Hi. I believe they also called at Los Angies, but alas for Ham Radio. They went to suburb of "Come up and See me Sometime" (Hollywood) and this time they let the A.I.F. down as they did "not" get a film contract. Certainly some of the boys are seeing their DX.

Basil Dale VK2XX/9XX was or is up at Moresby living a la native in a grass hut, which is much cooler than the RAAF tin variety. Basil touring has so far covered from New Guinea to Ultimo to Laverton to Richmond to Laverton to Townsville and hearily back home again to Moresby. Thanks Basil for all the other news which has been referred to previously. Tobacco is very cheap up there...20 cigarettes for 8d. best brands. Beer 1/- a bottle...leaves me with a sour taste on 27th Dec. Hi!

I hear the W/O Frank Hine 2QL has been on yet another tour of VK per RAAF Recruiting Train. I did hear that some irate young women who thought they "had" learnt morse, nearly chucked him in the Swan after he had given a report on it. That is quite in order, but does Mrs. 2QL know about the dinner the WAAFs gave

him when he passed through Melbourne...I suppose both Mr. and Mrs. 2QL will be visiting 2YC in the very near future. Hi.

VK 2PE is back from service with RAAF in the desert areas, but so far we have no real news from him. As mentioned before 2IP and 2VG are also back again. As 2IP was stationed at Khota Gharn he could no doubt tell us a few things.

To those other RAAFWR chaps who are still in malaya 2HZ, 3UH, 2XC and the rest we can only wish them the best of luck... being a nice polite non-political column. Hi. Will anyone hearing from any of them please send news to 2YC..('phone AU1042) or FHQ.

By the way, should any of you want to write to 3UH or 2KS, the QRA is "R.A.N. Telegraphist"...(K.G. Allen or L. Myers) C/o Aust. Navy Drafting Office. R.N.S. Portsmouth, England.

As any chap overseas is glad to receive home mail, how about some of you chaps who have had QSOs with these two sending them a little home news.

Our English visiting hams seem to have disappeared into the blue, so possibly they are in some other State.

And that, as the best BBC announcers say, "brings us to the end of the News." Don't forget that we want more and more bits of information about the chaps from each State and particularly about those Overseas.

Happy and Victorious New Year, Oms. and many thanks 9XX, 3IR, 2QL and 2 HC.

--- 2YC.

.....

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

- Federal Headquarters -

As a result of a survey of Institute activities carried out recently by Federal Headquarters it was found that in the Eastern States VK2, VK3 and to a smaller degree VK4 were still carrying on as in pre-war days. In New South Wales and Victoria regular Monthly General Meetings are still being held with of course varying attendances. VK3 is still publishing the Magazine whilst New South Wales is Headquarters Division. In Queensland a skeleton organisation is maintained by a number of Members meeting at various shacks each month. In Western

Australia, General and Council Meetings were suspended on and after 1/6/40 and the Executive Officers at that date were to remain in Office. Secretary to call Council together should the occasion warrant. The Annual General Meeting and Dinner to be held each year.

Unfortunately in VK5 and VK7 the organisation had been allowed to lapse but as the result of recent correspondence offers have been received from Members of those Divisions to re-organise these States and it is confidently expected that before long these Divisions will again be active.

With recent developments in the Pacific it is difficult to see what effect the new Call-Up will have on the various Divisions, but F.H.Q. strongly advises that every endeavor be made to keep the Institute alive in every State as far as possible. In bombed and blitzed Britain the R.S.G.B. averages 100 new members a month. Never let it be said that the W.I.A. had to close down.

With reference to the Census of Commonwealth Experimenters, favorable replies were received from VK2, VK3 and VK4 whilst VK6 were a little dubious of the results that would be obtained. In view of these expressions of opinion F.H.Q. decided to go ahead in an endeavor to have all circulars posted before 10th December - date of increase in postage. This proved quite an undertaking, but with the co-operation of VK2 Divisional Council and Members, this task was achieved with the resultant saving of approximately £5 in postage. F.H.Q. expresses thanks to those members that gave able assistance.

In all 2018 circulars were sent out and at the time of writing, ten days after they were posted, over 350 cards have been returned which augurs well for the success of the Census. When complete, the information obtained from the Census will be astounding as to the number of hams that are on Service, and just what they are doing.

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NEW SOUTH WALES DIVISION

The usual monthly General Meeting of the Institute was held at Y.M.C.A. Buildings on 18th December at 8 p.m.

The recent upheaval in the Pacific and its possible effects upon the Division was discussed at some length, and it was decided that should permanent blackouts be enforced, General Meetings at night be abandoned, and that the business of the Division be carried on by the present Councillors. Should

circumstances warrant the Secretary to call a Meeting at a suitable time and place. It is to be remembered that General Meetings at night will only cease should a permanent blackout be ordered. In addition to the above decision, it was decided that should no blackout be ordered, the present Council to carry on for a further twelve months. Members who were not present should not imagine for one moment that the Division feels it necessary to suspend operations. These steps were taken merely to ensure that the Institute will continue to function despite anything that certain individuals of obscure origin now resident in the land of the Setting Sun, may do.

A very interesting Lecture was delivered by the Treasurer, Bill McElrea VK2UV on "Interesting Developments in Amateur Radio." The Lecturer had devoted considerable time and thought to the subject and all present voted this talk the best for some time.

The Division has received Greetings from Members everywhere and one Member, Chris Cowan VK2PZ makes the following prophecy:- "In six months time, the Russians will be fighting on German soil; France will be fighting with us again at Germany's back door, and the Land of the Rising Sun will be the Land of the Setting Sun for all "Js" who dare threaten us. So in a years time you will be fondly polishing the mike and bottles again and calling CQ de VK2TI/2WI". Heres hoping.

The next Meeting of the Division, blackouts permitting, will be held at Y.M.C.A. Buildings on Thursday 15th. January 1942.

All the best for 1942

-- VK2TI.

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VICTORIAN DIVISION

Although the matter has not yet been discussed by Council, it seems likely, in view of the recent notification in the papers, that a permanent black-out would not be ordered for the time being, that the usual meeting nights will continue as usual. The next meeting will be on Tuesday 3rd of February.

3Rx..is believed to be busy with ships and their cargo, even tho' he doesn't talk about it. Has an 1851 tube in his BC receiver and finds it hard to control without losing gain.

3DH..had a wordy argument with 3RX on paper from which we glean that he is still at AW. 'Tis rumoured that Ivor is training his blank discs to come home when lent, as bases are very, very hard to get.

3TE..tells me that his home constructed electric clock is still working, in spite of the Japs...

3IW..has been listening around the SW bands and hears nothing 'cept numerous news broadcasts... There's not even a Ham on the air.

3XC..now resides in ViM.. Hope to see you some more OM.

3RQ..made his first appearance for two and a half years.. has seen quite a bit of VK....Wears three stripes on air force blue.

.....

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Meeting Night—First Tuesday in each month.

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

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BOX 284D, G.P.O., ADELAIDE.

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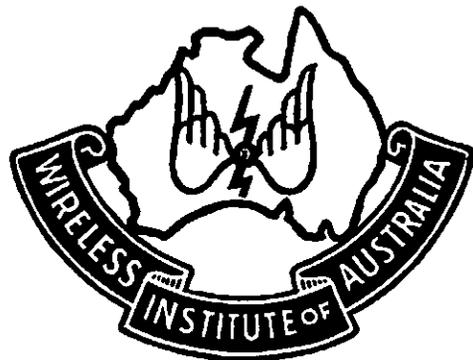
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FEBRUARY 1942

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Published by the Victorian Division

AMATEUR-RADIO

Vol. 10 No. 2

February, 1942.

RADIO EQUIPMENT OF THE LUFTWAFFE

By permission of the Ministry of Aircraft Production representatives of the Wireless World were enabled to examine at first hand the radio equipment in a number of crashed and captured German aircraft, and the following details are taken from an article which they wrote on the subject.

The German High Command has obligingly sent a large number of machines for inspection. Many arrived somewhat the worse for wear, but it did not take long to piece together complete and detailed specifications of all their equipment, including radio gear.

On the Me 109 fighter and radio installation is of the simplest type and consists of a single waveband transmitter and receiver continuously variable over the range 2.5 to 3.7 mcs. It is stowed away behind the pilot and the frequency is set before the machine takes off--no re-adjustment is possible while in the air. The useful range is estimated at 30 to 40 miles.

In bombers and fighter bombers, however, radio bulks largely in the aircraft equipment. "Bulk" is the right word for the standardized equipment actually weighs 358 lbs. It is built on the unit system and can be installed in different aircraft according to the requirements of the crew normally carried.

A few of the units such as the HT motor-generator, the DF receiver and its loop, the blind approach receivers and the antenna matching unit are housed in the tail of the machine, but the main transmitters and receivers are compact enough to be mounted on the instrument dash.

The chassis are die castings approximately cubical in shape and honeycombed with cells for valves, coils etc. and channels for wiring. Even the tuning condensers have die cast vanes.

Continuous tuning is possible over both wavebands, but

rapid selection of four spot frequencies is also possible and three can be pre-set and aligned with ground stations while in the air.

The output from each transmitter (about 65 watts) is fed through a low-impedance transmission line to the aerial matching unit in the fuselage. It is noted that the transmitters are designed primarily for CW operation, but there is also some provision for modulation.

The hollow streamlined spar which supports the fixed antenna is of bakelised laminated construction and houses the vertical rod for the horenz type approach beam receivers. The dipoles for the marker beacon receiver are fixed to the underside of the fuselage.

The DF installation has many interesting features though much of it is based on earlier commercial flying equipment. The standard compass is housed in the tail and its bearing, together with the loop setting are superimposed on a repeater dial on the dash.

A very compact "frame" aerial of unorthodox design has been adopted. It consists of a massive powdered iron core of oval section roughly a foot long and 3 inches average diameter, surrounded at intervals by sectionalised windings. Electrically it approaches the efficiency of the conventional large diameter frame and it has the advantage that it can be housed in a comparatively small bulge on the outside of the fuselage.

Three systems of direction finding can be selected by a master switch on the control unit. First, there is the ordinary figure-of-eight polar diagram for general use. Secondly a cardioid response which can be used either for DF or homing. When the latter is in use the frame is set to zero and a reversing cam changes the sense of the loop alternatively for the reception of interlaced 'A' and 'N' signals from the ground station. Thirdly, three signals, which are normally heard in the headphones can be rectified and applied to the visual indicator of the blind approach apparatus so that the pilot can converse with the crew on the internal telephone system, and at the same time keep an eye on his course. Both the tuning of the DF set and the rotation of the loop are effected by flexible wire cables.

Only two types of valves--one receiving and one transmitting are used throughout the system. The receiving valve is a pentode which can be used as a triode, mixer etc. It has side contacts with a ring seal. Inverted valve holders

with a built in socket for the 'top' contact are employed, and as the valve bases are thus flush with the outside of the chassis, a special screw knob is provided to extract the valves.

As far as could be judged, the equipment at present in use by the Luftwaffe, while of sound design and construction, contains nothing fundamentally new or advanced.

---o00o---

SALVAGE

THE WIRELESS CONTRIBUTION

In these days when scrap aluminium has become of great importance, it is interesting and instructive to read an editorial comment published in "The Wireless World." The following is taken from the editorial mentioned.

"In normal times few of us find anything good to say of the miser, but during a total war some of his traits are a distinct asset to the community. Anything that prevents waste of materials or human effort, saves shipping space or reduces the demands on our reserves of foreign exchange then becomes a matter of vital importance. For reasons such as these, efforts are now being made to salvage materials that at other times would be allowed to go to waste, either through simple economic considerations or because the salvaging effected would be thought insignificant.

This matter of salvage is as much psychological as material. Few of us can make any great individual contribution to the common cause, but wonders can be worked if everyone cultivates a state of mind bordering on the miserly with regard to waste, and regards every scrap of useful material that can be salvaged or reclaimed as a personal gift to the national war chest.

Generally speaking, radio can make no very spectacular response to the salvage appeal, but what it can do is well worth doing wholeheartedly. There is one type of scrap that is available in the radio industry and that is a very important one. It is aluminium.

There must be tons of aluminium in discarded receivers

dating back to the days when that metal was generally used for chassis construction. Again we expect that there are considerable stocks of almost worthless variable condensers or condenser vanes, many of the 'shaped plate' variety which were in general use at one time. No doubt many firms and individuals carrying out receiver maintenance work have accumulated large numbers of broken down electrolytic condensers, which contain an appreciable quantity of aluminium of the highest purity. When we add the quantities of discarded screening cans, inter-stage screens and even old loud speaker horns which must be available, it will be seen that the total is quite considerable."

May we suggest that our readers look through their "junk piles" and see what can be found in the way of scrap aluminium.

-----o00o-----

PAGES FROM THE PAST.

At the conclusion of the Great War of 1914-18, the Wireless Institute was instrumental in having the ban on transmissions lifted. In addition, the Institute had a long fight with the powers that be regarding conditions under which Experimenters would operate and in December 1922, the following Regulations were gazetted:-

"All wireless stations must be licensed by the Prime Minister's Department before they can be legally operated. Provision is made for the following classes of licenses:- Ship station, land station (for inland and isolated localities) coast stations, aircraft stations, aircraft station, portable station and experimental station (transmitting and receiving), the actual fees for which are fixed in respect of each at £1 per annum, while the fee for an experimental receiving station will be 10/-.

Genuine amateur experimenters are to be encouraged, but precautions are taken to ensure the safe working of defence and commercial stations which the indiscriminate use of wireless by amateurs would interfere with. Conditions are laid down regarding the permissible power to be used in cases where transmitting licenses are granted, the wavelengths to be employed and the technical features of receiving apparatus which may be capable of causing interference. Within a radius of five miles from a commercial or defence station no transmitters of the undamped (spark) type will be permitted, but other types of transmitters will be licensed with a power not exceeding 10 watts.

From 5 to 50 miles distance from such a type of station, any system of transmission will be allowed, with power not exceeding 20 watts, while over 50 miles transmitters operating on a power of 250 watts will be licensed. The wavelengths for such transmitting stations will be confined to the following ranges:- 150 to 250 metres for spark, I.C.W., CW, and telephony with a special band

for C.W. and telephony only from 410 to 440 metres. Interference is less likely to be caused on these wavelengths within these limits.

Applicants for experimenters licenses will be required to produce evidence of their technical fitness by experience or training, to conduct experiments usefully and operate their sets satisfactorily, before a licence can be granted. Applicants must also disclose particulars of apparatus they propose to operate. To ensure that all wireless stations are licensed, regular inspections of suspected stations will be made. With a view of enforcing the regulations, every retailer of wireless apparatus will be required to keep a record of the disposal of wireless apparatus, and may not sell any apparatus, unless the purchaser has, or is obtaining a licence.

Provision is also made for broadcasting stations which conduct the latest developments of wireless. Further consideration is being given to the most suitable method of licensing apparatus for the reception of broadcasting items so as to guarantee public satisfaction."

T. High.

---XXXXX---

SLOUCH HATS AND FORAGE CAPS

We can start off on a high note this month. VK2 Ham gets high award...and I'll bet you all missed it like I did...Sgt. Simpson (VK2ES) has been awarded the British Empire Medal, which is one of the highest distinctions of the War. Now, I suppose we Sydneyites will have to forgive him for all those 20 m. phone chats...life is very hard, sez us. At the time of this bulletin we know no more than that, but will let you know the whys and whens later.

Secondly, dated January 8th, 2TI and myself had letters from Bill Moore, 2HZ, in which he says that all the RAAFWR chaps...for 'home' service says the dope...are all safe and well in Malaya. Those VK2s and 3s who were up in Kota Bharu were evacuated safely. Bill says that dodging "eggs", after the first couple is rather thrilling. I'll bet he's bored from constant repetition, if what we read is correct. Hi! Anyway, its fb to know they are all safe so far, and here's hoping you are all safe at the end, Bill and chaps.

Talking of decorations...here's a story of a VK2 ham which is just heresay, but authentic as far as we know. This laddie is an officer in the A.I.F. Sigs and likes some other hams, after a nice holiday with the gods around Olympus, had a further rest in Crete before taking ship to depart, ahem! When the boat was about to leave, it was found there was no water aboard, so with three men this chap went four miles back through the German lines, secured a supply and managed to reach the ship again safely. Since then he has re-organised the Sigs in Syria...so perhaps the Hams will soon have at least one other Medallist.

Leaving the men for a moment, the lady hams are also in the services and represented by 6 YL who is in the WAAF as W yes, naturally, W/T Op. congratulations Mrs. Harris. We are keeping an eye on 6NL over here for you. I believe Miss 4YL has to help dad with the Women's Fire Fighting Auxilliary. Any news of our other YL Hams??

I hear from 5HG, who only for the War would still be doing those daily W skeds on 7 Mc that being considered a bit old for Active Service goes his Morse with The Naval Auxiliary, so you see, you just can't keep a "real ham" out of things.

As we do not hear much of the VK6s I have been trying to find out just where they are. Here are some brief notes, which I hope are correct, if not, some VK6 please set us right.

VK6SP, Leading Tel. HMAS Geelong. 6TM Air Gunner RAAF, 6ZO Telegraphist HMAS Toowoomba. 6 CC Sargent, RAAF. I did hear he was at Richmond as is 6NL. Just like 5HG, 6WS teaches 'em Morse at the Yachtsmen's Naval Auxiliary. In the Middle East is 6JG serving as an Air Gunner. VK6s President set his Division a good example being F/O at Parafield. Like many others he would like to do "this R/L", but nothing doing so far. 6 Cy, 6TP, and 6DR are all in the RAN. From the few I have obtained news of it can be safely judged that the VK6 are certainly keeping up a pretty high percentage in the Forces.

From Tasmania very little news comes up this way and the writer would appreciate a letter from one of the VK7s with any news. I hear that 7CT and 7DS are abroad with AIF Sigs, and that 7ER joined the RAAF but that completes my knowledge of the whereabouts of VK7 Hams on Service.

Thanks to 4WL I can let you know some VK4s quite concisely 4RF. 4RF, 4FJ, 4SD, 4EA, 4CJ are in the Navy, 4KK, 4OK, 4RH, 4AH in the RAAF, 4UU and 4JP in the AMF. Now is I only had three lines about each, look at all the news I would have for you.

Once again might I ask all your help with this section. Just a couple of lines about a chap makes news and as I said in the beginning, each of us knows a little, so dig up the old ham spirit and let us have the news...QRA 78 Maloney St. Eastlakes via MASCOT, N.S.W...phone MU1092.

2YC.

STOP PRESS...THE RAAF want W/T Ops Ground once again...so, if there are any of you left, get in touch with RAAF Recruiting Centre....

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

- Notes From Federal Headquarters -

Census Cards still continue to roll in and at the time of writing approximately 650 cards have been returned, and it is fully expected that at least 1000 replies will be received. Victoria and New South Wales, as would be expected, are leading the field with the greatest number of cards returned with VK3 shading VK2. This is rather surprising, as there are nearly two hundred more hams in N.S.W. than in Victoria. Many enquiries have been made regarding Membership of the Institute, and these have been forwarded on to the various States concerned.

Whilst numerous enquiries have been made regarding Membership, Federal Headquarters is perturbed with the number of replies to the question regarding Membership that state "was once but have not heard anything since outbreak of war" and at the January Executive Meeting, several schemes were discussed that would enable these Amateurs to be attached to some other Division or a central body until such time as the various States were able to overcome the disorganisation caused by the calling up of new age groups. This matter is important and at the present moment considerable attention is being devoted to the matter.

NEW SOUTH WALES DIVISION

The thirty-second Annual General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 15th January.

The Annual Report showed that Divisional activities had been well maintained throughout the year and that on no occasion had it been found necessary to abandon a General Meeting. This speaks volumes for the enthusiasm of Members, and the Divisional Council is appreciative of this support accorded them.

Membership throughout the year showed very little decrease, although revenue shows a slight falling off due to the increasing number of Members going on Active Service.

Upon the adoption of the Annual Report one minute's silence was observed in memory of Sergeant Curle VK2AJB, RAAF, who was accidentally killed in Egypt and Telegraphists Simpson 3SM and Rippon 6GR presumed lost on H.M.A.S. Sydney.

Members will be pleased to learn that Bill Moore 2HZ and his colleagues 2XQ and 2ALW have to date survived the blitz in Malaya. A recent letter from Bill states that he has had a "grandstand view of things" and will have a lot of tales to tell later on. It is understood that 2XQ has had a few adventures, but had managed to come through O.K.

An interesting visitor at Present in Sydney is Laurie Williams 9WL, and it is hoped to have him along at the February General Meeting. Laurie was in Rabaul when the Japs first raided that community and therefore has a first hand knowledge of blitz. After hearing 9WL's reactions to falling bombs, I think that there must be something about certain beverages obtainable in New Guinea that we don't get down here, and I don't mean Lomemade!

At conclusion of General Business a very interesting talk was delivered by Leading Telegraphist Sid Clarke upon his experiences in and around the Shaky Isles. "Blue" was followed by Lieutenant Fred Carruthers of Eastern Command Training School, Signal Wing who dealt with the routine and work necessary to turn out an Army Signaller. Upon conclusion both speakers received a hearty vote of thanks.

The next General Meeting of the Division will be held on Thursday 19th February. Black-outs permitting, and it is hoped that 9WL will be present to give members a resume of his experiences during the raid on Rabaul.

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VICTORIAN DIVISION

Just a reminder that the next monthly meeting will be held on Tuesday March 3rd...so keep up the attendances even if there is to be a black out...someone has to paint the windows black.

Men are urgently required by the Signals Dept. A.M.F. for work at six stations, 8/- to 9/- per day, operating at least 8 w.p.m., and class 2 men will be accepted. Anyone interested should contact Lt. Hiene at Albert Park.

Congratulations this month go to Jim 3ZK, now don't get ahead of me...Jim will be known in future as Uncle Jim, who by the way is still somewhere in VK2 keeping 'crates' in the air.

Ron, 3RW is by this time enjoying all the home comforts of army life...or at least I expect him to be. Ron expects to be a 'crack' CW op when he gets back on the air.. Still in hot water Ron?

Fred 3FR was seen for the first time in months last Tuesday night and seems to be enjoying the army.

3JO...what a story I have to tell about Herb...that is if my conclusions are correct...Who was supposed to post me the notes?

Jim 3NY our worthy?? treasurer reported for medical recently.. passed fit, but the bank still requires him for the time being. Has been playing with yards of black-out material.

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VICTORIAN DIVISION**

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Meeting Night—First Tuesday in each month.

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VK2NG; R. SMITH, VK2AIU; R. MILLER.

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H A M S !

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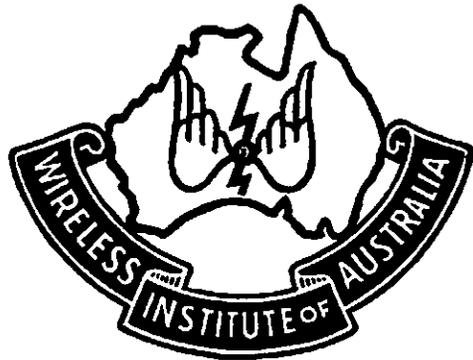
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SIXPENCE

MARCH 1942

AMATEUR RADIO

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BAFFLING THE SPEAKER

From an article by R. M. Gilbert in "Radio."

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Many an amateur has a dynamic type speaker that he would like to use in conjunction with his radio and recording equipment, but is at a loss when it comes to choosing and calculating dimensions for a suitable enclosure. For those faced with such a problem this article is written.

To be considered really high fidelity a speaker system should reproduce all frequencies from 30 to 1600 cycles per second with a response that is flat within about 5db. For the purposes of illustration a lower limit of 30 cycles has been chosen in the following designs.

For adequate baffling down to 30 cycles a baffle 36.3 feet square is necessary. Obviously for home use, such a large baffle is out of the question. To obtain the beneficial effects of such a baffle and still stay within reasonable limits as to size, some form of cabinet enclosure seems to be the best answer at present.

Before going ahead with the cabinet design it might be in order to mention that the effect of an infinitely large baffle can be obtained by mounting the speaker unit in the ceiling of a room or in one of the walls.

INFINITE BAFFLE.

One of the simplest enclosures that can be built to provide the necessary baffling action is an 'infinite baffle.' It consists of a box with a single hole for the speaker, strongly constructed and with the walls braced to prevent vibration. The shape is unimportant as long as the box is large enough for its resonant frequency to fall at or outside the lower limit of the speakers response range, and has sufficient lining of high absorption material. A half inch layer of mineral wool felt or rug cushioning will usually be enough.

A 12 inch speaker requires a box of about 8 cubic feet volume. Using this as a basis the following table gives the approximate box sizes for various speakers.

<u>Speaker Size</u>	<u>Volume of Box</u>		<u>Speaker Size</u>	<u>Volume of box.</u>
18 inch	12 cubic feet	..	10 inch	6.7 cubic feet
15 "	10 " "	..	8 "	5.3 " "
12 "	8 " "	..	6 "	4. " "

ACOUSTICAL LABYRINTH.

An acoustical labyrinth speaker is one having a long tube closely coupled to the rear of the cone. The tube should be one-half wavelength long at a frequency near the lower end of the response range, and is normally folded into a console cabinet, with the open end at the bottom or in the front of the cabinet.

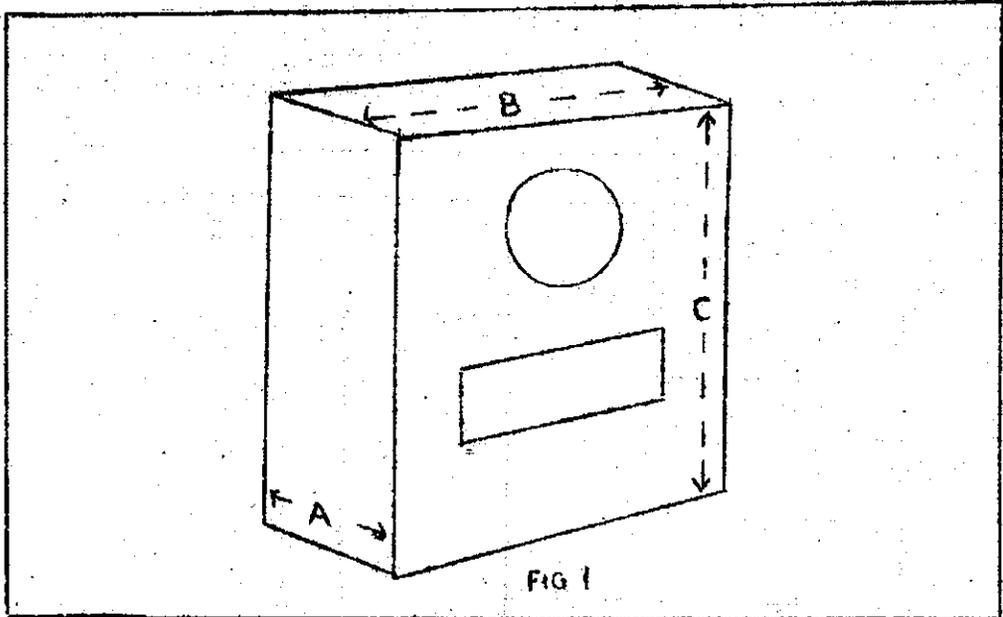
The absorption of the tube lining increases with frequency thereby greatly attenuating all except the lower frequencies. Making the tube a half wavelength long causes a re-inforcement of the front radiation of the cone by the radiation from the tube, since these are in phase at this point. The cross-sectional area of the tube should be approximately equal to the area of the speaker cone (as calculated by formula given later).

Not all of the improvement of the response range credited to the labyrinth is due to re-inforcement of the low frequencies, however, a great deal of improvement is the result of the baffling action of the long tube.

VENTED ENCLOSURE.

A vented enclosure for a speaker is another type of cabinet baffle which improves the speakers low frequency response by the in-phase addition of the back radiation to the front radiation of the cone at these low frequencies.

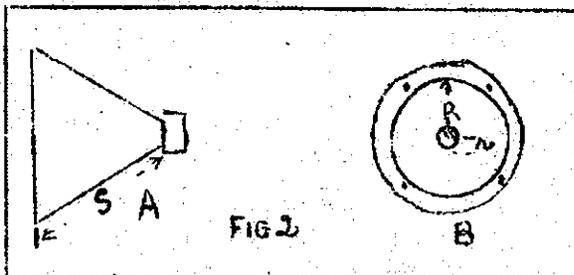
It consists of a box having two holes in the front, one for mounting the speaker, and the other by which the air in the box is acoustically coupled to the outside air. The box is partially lined with an absorbent material such as felt to absorb the higher frequencies and to prevent cabinet resonance. The cabinet should not be completely damped, as is required for the "infinite baffle" type cabinet. It is best to locate the speaker hole and vent fairly close together.



In the following table dimensions are given for various sizes of speakers. A, B, and C represent the measurements at the points indicated on the sketch.

Speaker.	A.	B.	C.	Volume
8 inch	9 7/8	16	22 1/8	3495
10 "	10 7/8	19 3/4	26 1/4	5640
12 "	11 3/8	22	28 7/8	7230
15 "	12 3/8	23 3/4	31 7/8	9370

The linear dimensions are inside dimensions in inches and the volumes are in cubic inches. The diameter of the speaker mounting is not given as it depends upon the speaker to be used.



The vent area likewise depends upon the particular speaker involved and can be easily calculated by the formula $A = 3.14 \times S (R \pm r)$ where A is the area in square inches, S is the slant height as shown in Fig 2 a, and R and r are one half of the diameter of the mouth of the

(Continued on page 5)

which, with underside playing, must be smaller than the title label.

Up to fifteen records are stacked on the three automatic release supports arranged around the outside of the record. The bottom record is dropped on to the turntable and played in the usual way by the top pick-up. At the end of the record the arm swings out, the turntable is stopped and restarted in the opposite direction and the bottom pick-up is gently raised into contact with the run-in groove of the underside of the record.

Finally, the dual tone arm swings clear of the record which is then gently deposited through a slot into a felt lined compartment at the side.

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(Continued from page 3)

cone and of the voice coil respectively. Shape of the vent is unimportant--either round or rectangular being equally good.

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PARAGRAPHS FROM THE PAST

... Radio Amateurs ...

- Broadcast Listeners -

PATRONISING ATTITUDE?

It is the current fashion for the lords of the amateur world to speak very patronisingly of the common herd of broadcast listeners, as if some special wisdom had been vouchsafed to amateurs that is withheld from the mere listener-in, says a writer in "Radio."

In a very few isolated cases, which are not by any means anywhere in the full glare of the limelight, this acquisition of wisdom may be taken for granted, but it is only fair to reveal to the general public that if it wants really sound practical advice on such aspects of wireless as concerns it most, then the best man to go to is certainly not the average amateur or his official organisation. Outside of a few special "stunts" the usual amateur is even as you and I, only less so.

The very fact that he holds broadcasting in supreme contempt or merely indulges in it as in secret vice, like

those who drink after 6 p.m or go to church between Saturday and Monday, puts him at once under suspicion as a hopeless incompetent in sublimary affairs.

The safest man to go to for advice on broadcasting reception is still and undoubtedly a reputable dealer, and even if he be charged more, and more openly, for his advice and shamelessly recommends his own goods, he will cost you far less in the long run than the average amateur foscicker.

(An extract from the Sunday Sun December 27th 1925)

P.M.G. AUTHORISES WAVELENGTHS FOR EXPERIMENTERS

Information has just come to hand from the Postmaster General's Department through the Chief Inspector of Wireless that the following wavelengths are authorised for experimental transmissions as from 1st January 1929:-

5	metres	to	5.35	metres
10	"	to	10.7	"
20.8	"	to	21.4	"
41	"	to	42.8	"
150.8	"	to	175	"
175	"	to	250	"

These bands are the only bands available for amateurs at present, and it will be probably necessary to rearrange them in about 12 months time, particularly the band 175 metres to 250 metres.

Transmissions on these wavelengths must be confined to experiments and tests, but the Department has decided to permit the exchange between amateurs of messages relating to experiments. In no circumstances can messages for a third party be transmitted without the permission of the Department.

Call signs for experimental stations will in future be prefixed with the letters VK instead of OA as at present. This comes into effect as from 1st January 1929.

(An extract from the Daily Guardian 14/12/28)

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SLOUCH HATS & FORAGE CAPS.

New Orders and "all that" depend entirely upon that utopian ideal of "co-operation" when it comes to news for A.R. for this.

ideal is mostly conspicuous by its absence and this column is no exception. Once again, how about a line of news from some of you. Have you any news of some ham's experiences in Malaya. If you live near his home you can easily get some - so - rather than let this column lapse for want of news, let's have a little for next month.

Owing to mail hold-ups, very little news comes to hand these days. One laddie with the "true ham spirit" went to quite a bit of trouble to try and find out how our chaps got on in that "impregnable fortress" of Singapore. I can't guarantee the accuracy of the statement, but it is believed that all our chaps managed to get out safely and I suppose are being bombed again in Java. One presumes Java, as the papers say R.A.A.F. arrived there. Bill Moore was the only one mentioned definitely. If anyone gets anything further, let me know in the next couple of weeks.

I hear that VK2ES took part in the first part of the 2nd Libyan Campaign. Doing some of that hush, hush work per truck he got mixed up in one of Rommel's break throughs. Speeding back to where our lines should have been his truck got bogged in the sand. German tanks were seen, but never came near enough to cause trouble, but I'll bet he breathed a sigh of relief when a friendly tank hove in sight and pulled him out of the sand. With typical ham ingenuity he arrived back in Cairo on Xmas Eve night - judgment!!

From 4RF at Canberra comes the following news which is an example of what a help a little news is in this column.

- 2EO - Dave is an old timer both in the Navy and in the world of DX, and at present has about 3 20KW rigs and a 2 00 KW rig in his care at the Navies Land Station.
- 2ACG - Another VK2 working (?) for the Navy. Alan punches a key most of the time and wishes he could CQ occasionally with that 20 KW!
- 2ANP - Also stationed at a RAN W/T Station punching a key for a crust. Congrats Jack on passing for a "Trained Operator" recently. "Give me the boats" says Jack!
- 3UI - Alan has probably forgotten how to punch the brass as he is strictly a D/F man now and helps us find the Raiders and what-have-you.
- 4EL - Eric is longing for the days when he can fight 4RF for choice DX again in the BERU!..! Remember when 4RF beat you to ES5D, SVIRX and CR9AA...? hi hi! Eric keeps the National Stations at VIB on the air these days.

- 4FJ - Roy is comparatively new in the Navy, but should have passed his "Telegraphist" Air Gunners Course, by now down at VIM. Not satisfied with the boats, wants wings as well, hi !
- 4NO - Norm is most likely battling with the mosquitoes, or whatever they have in the far North. Taking bearings at a Navy D/F station in between swotting the pes ts.
- 4S^u - Cilla prefers the sea and has been on a Corvette for many months now. Its about time you came back to VK om and worked some more DX with the scrap heap super of yours...!
- 4KZ - Cliff is another temporary "Dry land sailor" at Canberra and is a very old VK4. Personally I don't think you are very happy in the Service, Cliff.
- 4RF - Fred remembers the time recently when 2AGG was sending messages to the Fleet; 2ANP was working an overseas routine; 4KZ was reading messages from Admiralty and 4Rf had the Australian Navy at his fingertips...all at the same time! "We control the Fleet" hi!

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

- Federal Headquarters -

The position of the smaller States again came under discussion at the February Meeting of the Federal Executive, and it was decided that should a request be received from any Division F.H.Q. would take steps to set up a body to be known as the Wireless Institute of Australia, and enrol members from the States concerned. The Office Bearers would be the present members of Federal Headquarters. Members so enrolled would receive "Amateur Radio" thus enabling contact to be maintained and the most important aspect of the matter would be that the amateurs would not have drifted away from the Institute.

Census Cards still continue to trickle in and very soon an endeavor will be made to co-ordinate the wealth of information obtained. At this stage it is important to point out that you should return your card even though for various reasons you are unable to take any part in the national effort. Some amateurs when questioned regarding the non-receipt of their Census card, have replied that they didn't like sending it in as they weren't on Active Service! Every ham would like to be on Service, but in those cases where it is not there is usually a good reason, so lets have those cards.

The possibilities of forming an Emergency Communication net, similar to that which will operate in America under the Office of Civilian Defence - akin to our N.E.S. was discussed, but it was decided that in view of the number of hams on service, many difficulties would be encountered in having the necessary men available at all times.

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NEW SOUTH WALES DIVISION

The February General Meeting of the Division was held at Y.M.C.A. Buildings, Pitt Street, Sydney on 19th inst., the attendance being the best for some time.

Hams throughout Australia will be pleased to learn that Pilot Officer Bill Moore 2HZ and several of his mates, including 2XQ and 2ALW managed to get away from Singapore quite safely.

Our old friend Sid Clarke gave a demonstration with an Audio Oscillator of his own design suitable for Code Practice. In addition Sid brought along another piece of equipment not altogether associated with ham radio, but nevertheless of great interest to those members present.

Members will doubtless join with Council in expressing sympathy to our Vice President 2HP in his recent sad bereavements occasioned by the loss his father, and a nephew who was killed in action whilst serving with the R.A.A.F. in Malaya.

Laurie Williams who occupied the position of Secretary to the New Guinea Amateur Radio League prior to the cessation of transmissions was another interesting member present and "rogaled" the boys with his experiences in Rabaul during the first raids on that.

To that ever growing list of hams who have gone to meet the Great Brassfounder whilst serving their country must be added 3EI. 3EI was a Telegraphist in H.M.A.S. Parramatta.

Congratulations to our worthy President 2RA upon joining the ranks of the fathers. Yes, it was a boy and is Ray a proud daddy! At the present I understand that the young blighter has distinct tendencies towards fone!

The Division has offered to co-operate with the R. I's Department in their efforts to track down any enemy transmitters that may exist in this country. Whilst appreciative of the Divisions offer the authorities were of the opinion that as the technical requirements were such it would be impossible for the hams to be of any great assistance.

A letter from our old friend Bill Zech VK2ACP informs us that George Best VK2QC recently passed away. 2QC unfortunately was blind but nevertheless was quite a brilliant student in many fields.

VICTORIAN DIVISION

The next monthly meeting will be held on Tuesday 7th April, and if you have an amplifier receiver or any other such equipment, which you wish to test out, bring it along as there will be present at the meeting a cathode ray oscillograph capable of telling you just how the particular piece of gear is working. The instrument will be supplied by Mr. Ivor Morgan 3DH, who has access to this piece of equipment.

- 3RN.. is now of the army attached to area signals. Ron put in an appearance on Tues day night, but its doubtful when we'll see him again.
- 3Fr.. Now has his third stripe. Congrats Fred. The same gentleman is contemplating marriage, but he won't tell us when. Best wishes.
- 3ZK.. is again back in VIM.. Jim is going to be real PB when he gets into action...The practice at zig-zaging will help considerably.
- 3KR.. kept his marriage vory very quiet. Maybe just as well. What say Ken? Congratulations anyway..to you and the W.A.A.A.F.
- 3VH.. is in Syria attached to a signals unit.
- 3WE.. 'Tis rumored that Bill has "gone and done it"..Time will tell the true story.
- 3NY.. is at present enjoying the country air at Warracknabeal.
- 3DH.. when heard of was doing what a lot of us are doing--playing around with his car headlights.
- 3OF.. is a Petty Officer teaching morse at one of the naval establishments.
- 3JO.. now attends the Institute classes at least three nights a week.. 'Tis understood that he is going to apply to Council to supply a bod.
- 3UQ.. is to be found at No. 1 Recruiting depot where he tests out hopeful W/v's etc.

And in conclusion our congratulations go out to the XYL who did such an excellent job in blacking out the Institute windows.

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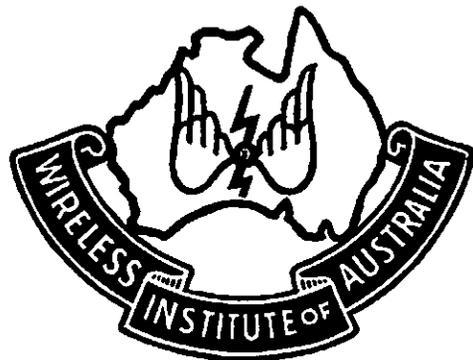
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SIXPENCE

APRIL 1942

AMATEUR RADIO

THE
OFFICIAL ORGAN
OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



Published by the Victorian Division

AMATEUR-RADIO

Vol 10. No. 4.

April, 1942

.. STEREOSCOPIC COLOUR TELEVISION ..

The Wireless World in a recent issue states that although much more work remains to be done before colour television in depth can be made available to theatre audiences, Mr. J. L. Baird has recently demonstrated the fact that a practical solution of the problem has been found for the individual receiver.

As in some earlier demonstration it is necessary for the viewer to sit directly in front of an image forming lens, but the tolerance in the matter of movement of the head is small since the left eye must not know what the right eye is seeing and vice versa. That is not to say that any special skill is called for in finding and holding the view point which makes the picture "come to life" and one can readily accede to the inventors suggestion that the system might be usefully employed in a "seeing telephone" system. The addition of a colour and a third dimension would be of inestimable value in demonstrating samples etc. to which two dimensional vision cannot do full justice.

A projection type cathode-ray tube is used for scanning the image of the spot being focused on the object by a lens. Complete 100 line frames are repeated 150 times per second, successive frames being scanned through green, red and blue filters and interlaced five times to give a 500 line picture. In a previous Baird demonstration of colour television, a 600 line picture with 50 frames per second was used, here being only two filters, red and blue-green; but for the present purpose of demonstrating the optical practicability of stereoscopic images no attempt has been made to restrict the side band frequencies.

The original scanning beam after passing through one of the colour filters and the projecting lens is divided by pairs of parallel mirrors into two subsidiary beams spaced by a distance equal to the average separation of the human eyes. A revolving

shutter with a special contour to correct geometrical scanning allows first one then the other beam to scan the object in succession. Light reflected from the object is picked up by sensitive photocells and the resulting current is made to modulate the transmitter.

At the receiving end the image formed on the screen of a cathode-ray tube is passed through synchronised colour filters and a revolving shutter which ensures that the alternating left and right hand images are reformed by the field lens in line with the appropriate eye of the viewer.

If the colour reproduction lacked the ability in this early experiment to differentiate the subtler shades it dealt faithfully with the bolder colours. The stereoscopic effects were an unqualified success, and when the person being televised reached towards the camera, his arm at the receiving end seemed to project out of the lens towards the viewer.

Mr. Baird is to be congratulated on the success of this new step towards the ultimate ideal of complete illusion in television and recognition should be given to his perseverance and detachment in keeping this particular line of research alive in war-time Britain.

-----oOo-----

EMERGENCY OUTPUT TRANSFORMERS.

If the output transformer of your set breaks down at a critical time when it is impossible to quickly obtain a replacement it has the tendency to make life seem rather hard. However there is really no need to despair if a disused power transformer or even a so-called bell-ringing transformer is available. The power transformer will, if we are lucky, probably possess two separate filament windings, and these can be pressed into service as the secondary winding for connecting to the speech coil, the mains winding being used as the primary.

We have got quite a range of ratios available for a rough attempt at matching, as we can use one filament winding along or can use the two in series or parallel. In the latter case however, be careful to get the two windings connected in the same "sense" or they will cancel out. If a bell transformer is available we have a tapped secondary labelled probably 3, 5, and 8 volts, the latter being the full winding. The 3 and 5 volt tapping will give us other ratios.

-----oOo-----

PAGES FROM THE PAST

ENGLAND ON TWENTY METRES

Successful two way daylight communication by radio on a wavelength of 20 metres was established on Saturday and Sunday by Mr. C. D. Maclurcan, of Sydney, and W. E. Simmonds, of Gerald's Cross, Bucks England.

On Sunday afternoon Mr. Maclurcan transmitted a message from the Prime Minister of Australia to the Prime Minister of Great Britain, and he sent and received messages of greeting and congratulations exchanged by the leading amateur Wireless Societies in Great Britain and Australia.

In this achievement the most important that has been made by Amateur wireless for a long time, the "Sun" has co-operated with Mr. Maclurcan here and with Mr. Simmonds in England.

"On Saturday afternoon, said Mr. Maclurcan today, I got Simmonds at once when I called him at three o'clock, and I heard his reply clearly. We exchanged greetings for half an hour or so, but his signals were rapidly getting weaker and he was very hard to hold at the end of the test.

On Sunday at the same time, Simmonds replied immediately to my call, his signals being much stronger. We worked for an hour, until again his signals began to get unstable and to fade. Apparently he was having no difficulty in getting me, because he never asked me to repeat anything.

I had anticipated a successful result of the Sunday test, and in the meantime I had got in touch with Mr. Bruce at Melbourne. He gave me the following message to send:-

'Prime Minister, England--On occasion of this achievement, Australia sends greetings. (Signed) Bruce, Prime Minister of Australia.'

I also sent this message to Mr. Eccles, President of the Wireless Society of Great Britain-- 'Greetings to Wireless Society of Great Britain from Wireless Institute of Australia, New South Wales Division, by first 20 metre daylight working, Signed - Maclurcan, President.'

Simmonds ok'd both of these messages and sent me this one:- 'Greetings to Wireless Institute by direct Amateur 20 metre working from R.S.G.B., signed, Eccles, President.' This was all we were able to do as signals grew faint here as the sun went down.

Also I broke a valve. I hope to get another set up for

another test today. Then I may get from Simmonds some particulars about his set and the power he is using. I still think his power is too low.' (Good on you Charles, you are a man after my own heart. T. High).

I tried on Sunday to get a message from Sir George Fuller for transmission, but I could not reach him in time, and he actually rang up when I was in the middle of communication so that I could not take his message.

'I don't think I could stand very much more of the strain of these extreme distance tests, and I am glad this one is nearly over' added Mr. Maclurcan. 'The tuning is so very fine, and the concentration called for so intense. Even a slight movement of my body would interfere with the tuning. My method of regulating it was to move my open hand a little nearer or a little away from the set. Even the movement of my chest would cause Simmonds signals to fade.

On Friday afternoon I had a most satisfactory half-hour with a Japanese operator. (Now I know why you want a Freedom Radio. T. High). Mr. D. Arakawa at Iwatsuki Radio, Tokio. His signals were excellently sent and in perfect English. He had heard me working England on twenty metres, and - this interested me very much - he had also heard snatches of my speech when I was trying to get the voice over. There should be really no difficulty about sending the voice; the only one is that which I have referred to, tuning, and for speech the tuning must be very exact. Unfortunately his wavelength was two metres more than mine, and we did not actually exchange messages although we heard each other well....."

T. High.

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.... SLOUCH HATS and FORAGE CAPS

March 25th....what will another month bring?...Surely a big mail at VK2YC telling what chaps have returned home, or from the chaps themselves telling us of the overseas hams they met when they were "over the otherside." I feel that a special medal should be struck for 4RF...news for this column three months in succession, and the lad never leaves the Naval Station. Its the old story of the "will finding the way." Thanks om, and may the baby daughter never keep you up at night. By the way, keep an eye out for that grandchild of 2PX. Hi.

At the moment of writing 2XQ is the only one of the RAAFWR that I know to have arrived back safely from Malaya. Detracting somewhat from this very fb news is "a grapevine" that our ex-President 2HZ did not get away, as was first supposed...has

anybody news of 3YK?

The VK2 Division has received a P.O.W. Card from 2AKE who reports (5/10/41) that his first home letter had arrived and that parcels were also getting there. Hope our VK2 Civ. Parcel gets to him and Snow O.K. He mentions he knows 3MR is a prisoner, but that he hasn't arrived at his camp (Prato Isarco) yet. Jim reports everything fb and, to use the ABC alibi, end up "with those words", "Space is limited so give my 73s to any of the boys, and a Merry XMasote and best of luck. Cheerio and 73 de Jim..ex VK2AKE"...so I guess the Italian Censor must be related to IIR or some such, what?

To 2ALG goes our thanks for the first news of the Ws. He reports meeting Cpt. Ray Daly W9ZRA, Tech-Sgt. Bill Olson 9DRB and Tech-Sgt. Mike Strachan 9PFI. Also that Dr. Monco W6ZL was there on abut hasn't been back since. However, Joe says up in our Northern Outpost they are too busy for social calls these days. He also says he has met VK2AMP of the Sigs and 2AMQ of the Engineers while a new Officer billeted with him turned out to be 2YM ex 4BE. So as we all agree its hard not to find a ham wherever one may be. Many thanks Joe, om, for the news, may you soon be a Captain instead of a "Loot." Hi.

By the way our Sydney newspapers speak of Ws in VK4 and VK3, but as I haven't had a line from either State about them, I presume it is just the usual newspaper gossip. How about it VK3 and VK4?

From 4RF I have the following: -

3RY.. A Petty Officer in the R.A.N. is now busily engaged servicing Supers and slinging up spare sky-wires at a Naval W/T Station.

4Lt..Last heard of Albert mucking about Thursday Island for the Militia. Look out for those J5s om. Better send him some J QSLs om...2YC.

4KZ..Recently had a nice air trip from Adelaide to Darwin, but I think you would rather the "boats", Cliff.

4RF..Just acquired a "Simplex Auto" which he prefers to his American "Mac-Koy", but thinks its too early to teach his wock-old baby daughter how to pound the brass. Lots of QRM around the house these days.

2AGG and 2ANP can't see any connection between wielding air raid trench implements and punching a key re their war effort in the Navy. Hi.

Thanks om, wish I had another half a dozen correspondents like you.

Last Sunday Arthur of 4AW "dropped" in at 2YC. Arthur has been changed from Cootamundra to VIM, and was on a Flight north when bad WX farther on brought them down at Mascot, which is quite new 2YCs. However, 4AW put over some story about "Ossifers" NOT digging and so our Air Raid Shelter wasn't helped a bit, and I'm not at all sure he was within his Official rights, either.

Basil Dale 9XX/2XX is now in VIM instead of Moresby, and wishes to be remembered to all the boys. You should have stayed there and got our column the front line news on, Hi.

Well, 73, oms, and, please..how about some news...GRA..78 Maloney St., MASCOT. N.S.W...phone M.U.1092.

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.. BOOK REVIEW ..

THE RADIO HANDBOOK, Eighth (1942) Edition, by the Editors of Radio. Published by Editors and Engineers, Ltd., 1300 Kenwood Road, Santa Barbara, California. 640 pages $6\frac{1}{2}$ by $9\frac{1}{2}$, profusely illustrated with 577 line drawings and half tones, and 41 tables.

The RADIO HANDBOOK is a general compilation of information on the practical aspects of radio. Its content can be divided into three classifications: (1) basic theory of electricity, radio, vacuum tubes, and antennas, written from the standpoint of practice rather than from the engineering viewpoint; (2) constructional information on the building of a wide variety of types of high frequency and u.h.f. transmitters and receivers for phone and c.w. use, coupled with information on the construction of many useful pieces of test equipment; (3) tube characteristic tables, reference charts and graphs, and a collection of formulas useful to the practicing radioman.

Investigation to determine the principal sale of previous editions indicates that there were two main classes of buyers; those who were using the Handbook as a reference work and hence had greatest need for the comprehensive tube tables, charts, tabular material, and formulas; and those schools who were using the RADIO HANDBOOK as a radio instruction textbook.

As a consequence of this investigation the tube tables have been expanded as well as being brought up to date, and the reference material has been considerably increased. To assist those using the Handbook as a text the theory chapters have been rewritten and expanded with an eye to increasing their suitability to this application. Due to a more compact type style and an increased number of pages, these increases in text and reference

material have been made with no sacrifice in the amount of space devoted to constructional information.

Investigation also showed that one reason this Handbook is so widely used as a textbook is that no other comparable book contains so much up-to-date information suitable for instruction in the subjects of F.M. and U.H.F. communication, in addition to the usual radio and electrical theory.

The RADIO HANDBOOK contains the most comprehensive information available in any one book on all types of transmitting, receiving, and special-purpose tubes. A total of 54 pages is devoted to this extensive listing. Both transmitting and receiving tubes are listed in the order of their assigned number to make it possible to find the characteristics of the desired tube in the least amount of time.

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

.. Notes from Federal Headquarters ..

The December Calendar of the International Amateur Radio Union has just arrived with the intimation that this issue will be the last until such time as peace again reigns supreme. This state of affairs, after two years of war, is only to be expected. As the Calendar existed purely as a means of conducting the affairs of the Union and as no Society had any business to bring forward, there was no option other than to cease publication. A skeleton staff will be maintained of course until such time as the Union again functions.

Emergency Communication networks were again discussed, and it was decided that the States be circularised in an endeavor to ascertain the manpower available to put such a scheme into operation.

It was hoped to place before Members, some details of the Federal Census with this issue of "Amateur Radio", but as cards are still trickling in, it was thought advisable to postpone the task of co-ordination for at least another month.

-----oo00oo-----

NEW SOUTH WALES DIVISION

The monthly General Meeting was held as usual at Y.M.C.A. Buildings on Thursday 19th March.

A very interesting and instructive Lecture was delivered by Mr. P. F. Dixon VK2AFB, on "Valves, their Characteristics and Construction". This talk was very much appreciated by all present.

No further news has been heard of the R.A.A.F. gang since they left Singapore. Anyone able to forward any news of 2HZ, 2ZQ or 2AIW is asked to do so as soon as possible. Some considerable discussion took place regarding a proposed Emergency Communication network and it was decided to make a survey of the manpower available to put such a scheme into operation.

Still they go. Latest member of Council to join up for the duration is Alan Joscelyne 2AJ0. Alan is now a member of 2nd Divvy Signals.

-- VICTORIAN DIVISION --

The morse classes which the Division has been conducting for many months, twice a week, are now to be extended to four nights a week, - Monday, Tuesday, Wednesday and Thursday. The class Manager, Mr. H. N. Stevens VK3JO reports that this is due to a large increase in students obtained through the co-operation of VK3UQ who is attached to the R.A.A.F. Recruiting centre. All speeds are catered for at the classes, the instructors being mostly old Navy, Army and Air Force operators.

More Instructors are required, and anyone who can help should get in touch with Mr. Stevens at the Institute Rooms, or telephone F6997.

The last meeting saw the attendance of one of our American friends W6PBO, who hails from California. He is a

Sgnt. in Signals and has promised to try and produce a few more W's. Thanks OM, we've been trying for some time to get in touch without success. The Institute is very desirous in meeting as many of the W's as possible, so anyone who knows of one give him the Institute Telephone number.

The meeting was favoured by the introduction of two oscillographs (it never rains but it pours). One was brought in by Mr. Quigley, a 902 home constructed job. The other was a commercially manufactured one provided by Mr. Ivor Morgan 3DH. The wave forms of various audio oscillators and standard frequency recordings were studied, and the evening proved very interesting.

We regret to announce that P/O A. E. Tinkler VK3ZV has been reported missing as result of Enemy Operations.

3JO...the class manager...some of us wonder why Herb goes in every night now. After the report that there are several YL's attending the classes...One never knows.

3NY...is attending A.R.P. Classes.

3RF...is doing a little speech amplifier work, and is, I believe a member of the local V.D.C.

3NX...is a member of the R.A.A.F. ground staff.

3NQ...is to be congratulated on his marriage recently, is a member of the A.M.F.

3UK...is reported to be dodging bombs somewhere in the north.

3BW and 3BU paid a flying visit to the meeting last Tuesday night.

3WG...not seen very much but heard of occasionally keeping R.A.A.F. installations running smoothly.

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Meeting Night—First Tuesday in each month.

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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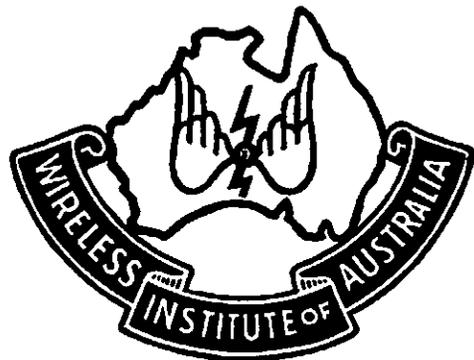
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MAY 1942

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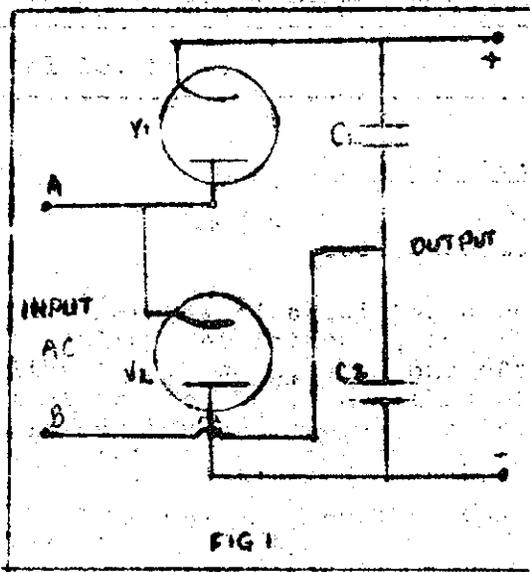
1942.

VOLTAGE MULTIPLYING RECTIFIERS

From an Article by W.T. Cocking in "Wireless World"

Methods of obtaining a result with a minimum of material are always of interest, and this is especially so at a time like the present, when one often has to make do with parts that are to hand. A method of obtaining quite high voltages without having to employ a transformer is described, it forms a useful alternative to more orthodox circuits.

The voltage doubler circuit is very well known, but it is not always realised that the principle can be extended; voltage-tripler and voltage-quadrupler circuits being quite feasible. It is first necessary to be quite clear about the mode of operation of the doubler circuit. The arrangement is shown in Fig. 1. and it will be seen that two valves are used with two reservoir condensers. The AC input can be either from a transformer or directly from the mains. On the positive half cycles of the input the point A is positive with respect to B and the anode of V1 is positive with respect to its cathode for this valve is connected in series with C1 across AB. The valve consequently conducts and charges C1, the upper plate of this condenser becoming positive with respect to the lower. The cathode of V2 however is connected to A so that its anode is more negative than its cathode and in consequence it does not operate. On the negative half cycles, the operation is reversed, and the condenser C2 now becomes charged through V2 and its upper plate becomes positive with respect to the lower. The output voltage is taken



across the two condensers in series and is thus twice that on either condenser alone. When no current is taken from the output each condenser charges to a potential of 1.414 times the RMS value of the input alternating voltage. On load the voltage naturally drops.

The voltage doubler of Fig 1 is based upon the series type half wave rectifier of Fig 2 (a) and consists merely of two of these used together. It is however, equally possible to employ the parallel type of rectifier shown in Fig 2 (b). The operation is substantially the same. The valve conducts on the negative half cycles and the condenser charges, its right hand plate becoming positive with respect to its left hand. When two of these rectifiers are put together in the obvious

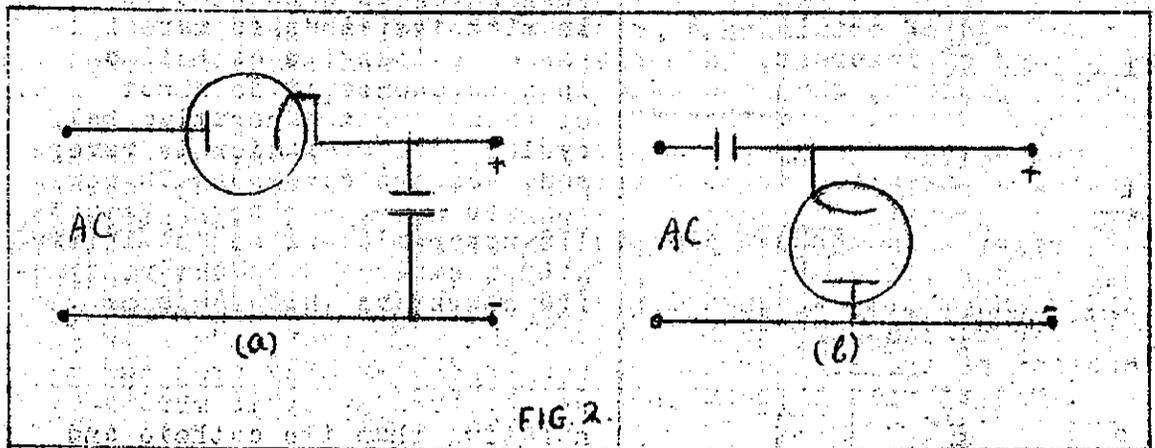


FIG 2.

way the voltage doubler of Fig 1 results. This normal voltage doubler therefore can be broken down into two series type half wave rectifiers, or into two parallel type.

It is, however, possible to build a voltage doubler from one half wave rectifier of each type instead of from two of either. This is shown in Fig 3. Before discussing this circuit it is necessary to be quite clear about the simpler half-wave rectifiers of Fig 2. The series circuit (a) works on the positive half cycles of the input and on no load the condenser becomes charged to the peak value of the input voltage. On load the voltage across the condenser fluctuates. The mean discharge current constitutes the current drawn from the circuit and used in the load, while the fluctuations are the ripple or hum on the output.

In the case of the shunt circuit (b) exactly the same thing happens, so far as the condenser is concerned, but the output is now the condenser voltage in series with the Ac supply. When no current is drawn the output voltage is fluctuating between zero and twice the peak value of the input. This is why the circuit as it stands is never used. Even on no load the ripply voltage on the output is equal to the mean steady voltage.

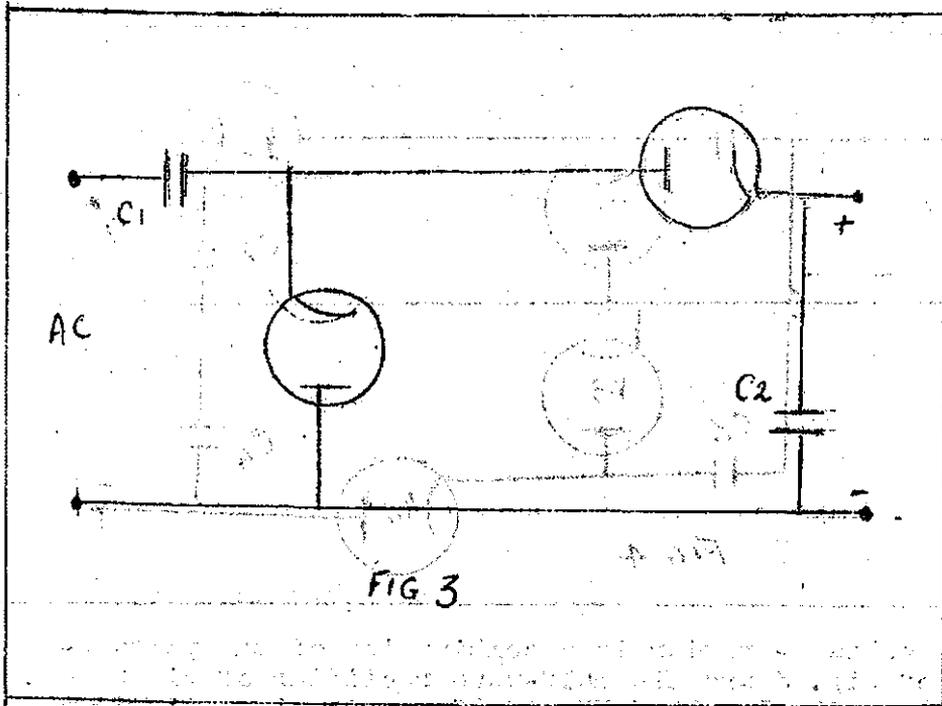
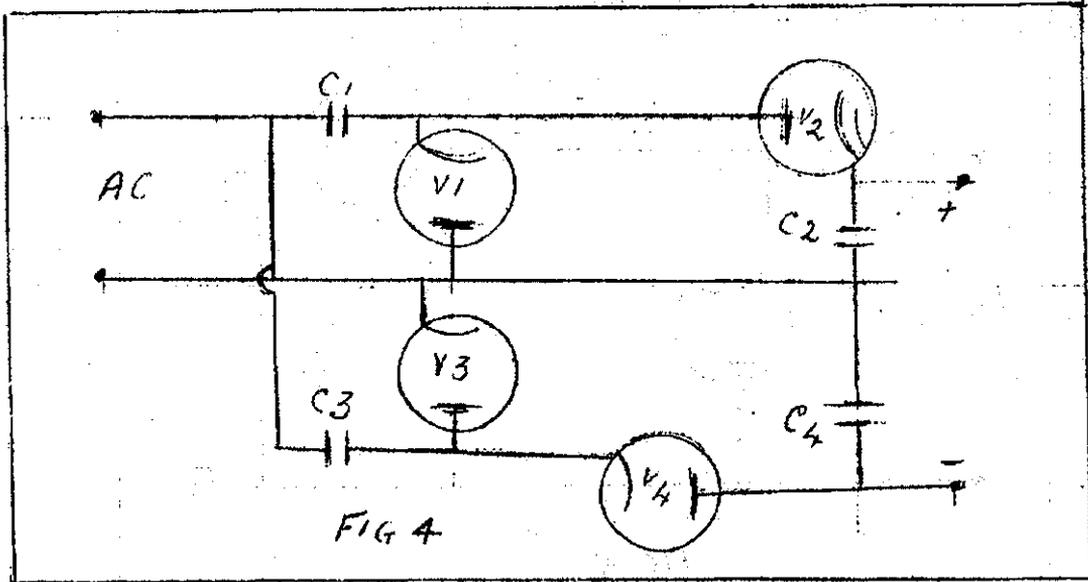


FIG 3

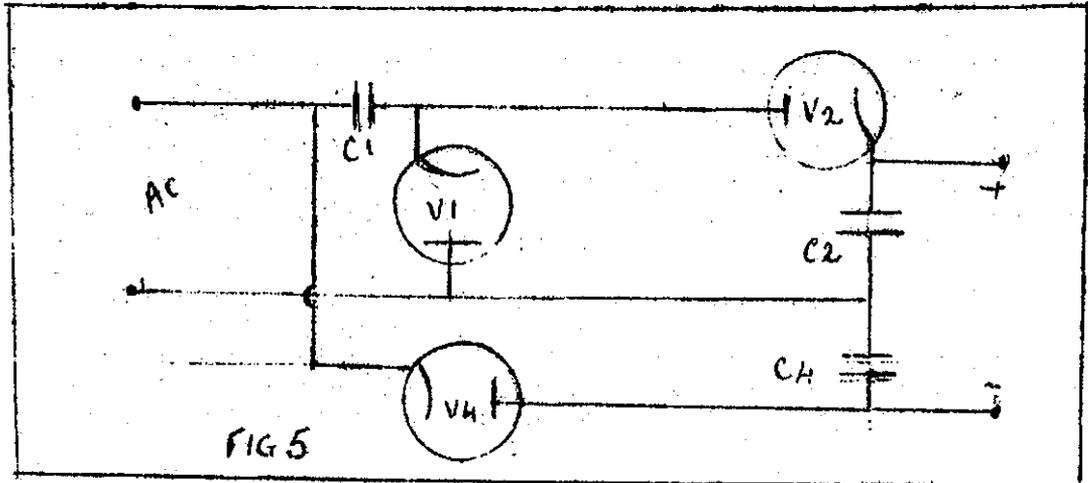
This effect is turned to advantage in the voltage-doubler of Fig 3 however, and it will be seen that this circuit consists of a series type half wave rectifier following a parallel type. What happens is this--V1 conducts on the negative half cycles of the input voltage, and C1 charges so that its right hand plate becomes positive with respect to its left. V2 is non-conducting during these periods. On the positive half cycles V1 becomes non-conductive and V2 conductive. The voltage acting on V2, however, is not merely the input voltage but the sum of this voltage and that across C1. On no load C1 is charged to the peak value of the input and C2 to twice this value. This condenser therefore must be rated for working at twice the voltage that will suffice for C1 the rating for the latter being the peak input voltage.

It should be pointed out here that in the foregoing description the term half-cycle has been used as if the valves conducted for precisely this time. In actual fact this period is usually less than one half cycle and depends on the load and condenser capacity.

The voltage-quadrupler should now be clear. It is nothing more than two voltage-doublers of the type of Fig 3 and the arrangement is shown in Fig 4. C2 and C4 should be twice the voltage rating of C1 and C3 but the capacities can be the same.



The voltage-tripler is a combination of the voltage-doubler of Fig. 3 and the half-wave rectifier of Fig 2 (a). It is the quadrupler less V3 and C3 and is shown in Fig 5.



The regulation of these circuits is by no means good unless very large capacities are used. This is not only expensive but bad for the rectifiers on account of the high peak currents which will then flow. In general they are most valuable when high voltages at low currents are desired.

In conclusion it should be pointed out that although the diagrams all show valves for the rectifiers there is no reason why metal rectifiers should not be used.

BOOK REVIEW.

We are proud to announce publication of the 1942 edition of the RADIO AMATEUR'S HANDBOOK -- for sixteen years the internationally-recognised standard manual of high-frequency communication.

The 1942 edition continues the long record of comprehensive and authoritative coverage of its field established by its eighteen predecessors. The field of short-wave radio knowledge has been compressed between its two covers. Its pages contain all the latest and best in ideas and equipment.

In the preparation of this new handbook dozens of items of equipment were constructed and tested. As always, this equipment represents the best in current amateur practice rather than striking or novel innovations of unproved merit, and is based on time-tried circuits and layouts of established worth.

In planning the handbook for 1942, the editors were governed by defense needs. The general plan of the book has been revised to meet the growing need for simple and non-mathematical, but thorough, text on the theory, design and operation of radio communication equipment, as well as to provide the constructional information on tested and proved amateur gear which has always been an outstanding feature of the book.

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SLOUCH HATS and FORAGE CAPS

When this column was first started one representative from each State was to forward me notes each month. After roughly six months no Interstate Notes have yet reached me, nor have any State representatives been chosen as far as I am aware. In States where the WIA is dormant, this is not very encouraging, but it shows all the signs of "India's Famous Non-co-operation Policy," in States where the Institute still meets each month. How about it VK 3, 4, 5, 6 & 7 ????. There are most of the chaps back home from abroad, so how about some news of them, and their doings.

Over here is VK2...2X, 2FX, 2FT & 2ZK are definitely known to be "Back home" although the general news seems to be that "all the chaps got back."

One whom this does not apply, worse luck, is our Ex Fed. President and State Councillor, Bill Moore 2HZ, whom duty seems to have necessitated that he stay in Java while others were able to escape. To do ones duty under such conditions, when loved ones are most prominent in ones mind, and ones friends seem to have "all the luck," takes pretty high courage...so you will all join me, I know, in saying....Good Luck, Bill... hpc cuagn, em.

Harold Ackling 2PX returned from the Middle East and the Three Campaigns over that way, along with 2AFT and others. They are now "quite" sure there is no place like "old VK." Hi! 2PX has now reached the stage of being "two grandfathers"...somebody said that the first grandchild is already in the post-war RAAPWk, but "I" can't say for sure...seems pretty good even for a descendant of 2PX. Hi!

2ZK...Captain Henry now if you don't mind...is also back. Both the above boys speak very highly of Arthur's work as a technician, and feel he deserves the promotion. Speaking personally, 2YC wonders where all the other Commissions are that were to come to those who enlisted in Arthur's Special Duty Unit?????

2AMA writes from among the Yanks and (he hasn't met a Ham yet) Australia's North. He has met 2AMS and 2AMP and 2ALG so he should have a good time in his spare moments. They will tell you about Xmas in the North after the War. He didn't say just which one of them could get into a hole quickest when the Js go SO, but dignity plays no part in the race. Hi!

Digressing a little from VKs...The Jan., English Ham Mag (the T & K Bulletin) reports the death over there in an aeroplane accident of ZL4AI whilst carrying out highly important work for the RAF. Anybody who knew the Radio Calibre of 4AI will have little doubt this was real HUSH HUSH stuff. The loss of 4AI will be felt by New Zealand Ham Radio when the war is over, particularly when the time comes again to call "Test Beru."

Coc Horne, 2AIK, is thinking of trying to change from the AMP to RAAP. This is Coc's second War, and judging by the Education Department's efforts to get him out, they think one per lifetime is enough. Hope you beat them to it Coc, om.

VK2AKT may have also failed to get out of Java. Bert left Australia in the second week of war as a Corporal..Wireless O. Mechanic. After 13 months he was invalided back with Malaria having risen in that time to Flight Sargent. Progressing to F/O he was stationed at Richmond before being lent on Special Duty to RAF. He served in Malaya and was last mentioned as being in Batavia...but we hope he will be among those who "got away."

VK2LJK has been transferred from VK3 to far up into VK4..goes to meet Tom this chap, must be sky a few J QSLs....where he is doing Instructional work. He seems to think they could find more exciting work for a Sargent to do.

2HC also a Sargent these days in still instructing at Bradfield. I am sure all VK Hams join in wishing our Fed. QSL Officer 3RJ heartiest congratulations on at last getting a Commission. Its a Service check full of talent when an Op with Ray's experience of traffic handling takes as long as this to get a Commission...anyway good luck Ray, om. hope you'll be a Flight Loot, vy soon. Hi!

3YX is reported to be back in VK3 after his escape from Singapore. We're waiting for your story OM. 3UW and 3XS are miss- ing believed to be prisoners of war. 33G has arrived back from the

Middle East. 3AC is somewhere in the Pacific. 3KR is now a Flight Sgnt. 3AB is with a RAAF Mobile Squadron. 5ZX is a pilot officer while 2OR has the rank of Flying Officer. 5JT is a RAAF Sgnt.

Well, that's all the news I have...BUT...What about those State Representatives or some news...C/o 78 Maloney St. Mascot N.S.W. or Telephone MUL092.

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ON ACTIVE SERVICE

Herewith a list of New South Wales Amateurs on active Service compiled from Cards returned to Federal Headquarters. If you are on Service and your name does not appear on this list, kindly furnish full particulars to Divisional Secretary, 21 Tunstall Avenue Kingsford, N.S.W. as soon as possible.

ARMY.

Capt. A. Harry	A.I.F.	VK2ZK	Lieut.	S. Jacobs	A.M.F.	VK2SJ
Sgtn H. Ackling	"	VK2PX	Capt.	S. Tatham	"	VK2ST
Sgtn H. Hilder	"	VK2AFT	Lieut.	G. Partridge	"	VK2VU
Sgtn A. Pearce	"	VK2AHB	Corporal	A. Stower	"	VK2ACX
Sgtn F.C. Deaman	"	VK2ADH	Capt. J. Wells	"	"	VK2AME
Sergt. J.D. Ollie	"	VK2OZ	Sgtn J. Franklin	"	"	VK2ALP
Sgtn D. Campbell	"	VK2CU	Lieut. J. Ackerman	"	"	VK2ALG
Corp. G.T. Slawson	"	VK2AFH	Sgtn A.J. Scelyne	"	"	VK2AJO
Corp. T.J. Davies	"	VK2ADS	Corp. F. Bull	"	"	VK2AJM
W/O Lloyd Davies	"	VK2AI	Sergent C. Horne	"	"	VK2AIK
Sgtn H.S. Cottorill	"	VK2ZY	Sergent A.J. Pratt	"	"	VK2AHE
Lieut. J.H. Cooper	"	VK2ZG	Sergent F.U. Curlewis	"	"	VK2AHC
Sarg. E. Simpson	"	VK2ES	Corporal G. Pryor	"	"	VK2AMP
Corp. G.A. Rutter	A.M.F.	VK2CB	Sapper R. Haining	"	"	VK2AMQ
Gunner D. Dunn	"	VK2EG	Captain I. Gardiner	"	"	VK2ABY
Captain N.J. Hurrell	"	VK2HJ	Chaplain M. Winkler	A.I.F.	"	VK2MP
Captain D.B. Knock	"	VK2NO	Gunner H. Hocking	A.M.F.	"	VK2AMG
Sgtn G.G. Bower	"	VK2O1	Sgtn H. Bushnell	A.I.F.	"	VK2AHG
Lieut. F.A. Carruthers	"	VK2PF	Sgtn C. Roberts	"	"	VK2JV
W.O. R. Felton	"	VK2RF				

NAVY.

P.O. Tel. D. Duff	VK2EO	L.T.O. R.G. Morgan	VK2ABM
Lieut. Comdr. L. Swain	VK2CS	Lieut (E). Ian Cuffe	VK2XC
P.O. Tel. W. L. Harriss	VK2ALF	L.T.O. L.S. Moyers	VK2XS
T.O. Tel. H.S. Young	VK2AMZ	P.O. Tel. L.C. Brackon	VK2FF
T.O. Tel. L.J. Case	VK2AMJ	Chief R.O. W. Johnston	VK2YZ
Tel. H.C. Parris	VK2AIH	Chief R.O. K.B. Brown	VK2AKB
P.O. G.S. McLeod	VK2ADC	R.O. J. Field	VK2AKF
Tel. J.M.D. Roberts	VK2ACK	R.O. H. Fuller	VK2VK
Tel. A. Morris-Ross	VK2ACG	R.O. J. Ellis	VK2AIL

xxxxxxx

AIR FORCE.

Pilot Officer W.M. Moore	VK2HZ	A.C. 11. C. McDonald	VK2AKK
Flt. Lieut. J.L. Grey	VK2AKO	Sergeant K.W. Graham	VK2AKG
L.A.C. J.A. Keaco	VK2AMV	Sergeant A. Marwaring	VK2JK
Pilot Officer K.G. Avery	VK2AMS	A.C. 1 V. Egan	VK2AJI
L.A.C. D. Dongan	VK2AMF	Sergeant S. Weston	VK2AJH
Flt. Lieut. T.G. Thorp	VK2AMC	A.C.1 8 G. C. Curle	VK2AJB
Sergeant Lionel Cuffe	VK2AMA	Sergeant E. Globeurne	VK2AIL
Corporal V. Jarvis	VK2VJ	Sergeant G. Bailey	VK2AGI
Pilot Officer F.M. Geyen	VK2UX	Sergeant A. Hughes	VK2AGR
Sergeant K. Shrock	VK2TQ	Corporal R.W. Eagling	VK2AEY
W/O F. Hine	VK2QL	Pilot Off. A. Hayvatt	VK2AET
L.A.C. A. Fietz	VK2QE	Sergeant J. Howes	VK2ABS
Flying Officer M. Brown	VK2OR	Corporal F. Stirk	VK2ABC
LAC. W. Francis	VK2OF	Sergeant E. McNaughton	VK2ZH
L.A.C. L. Dodds	VK2LD	Sergeant J. Woodman	VK2ZE
Sergeant H. Carter	VK2HC	A.C. 1 J. Walters	VK2LW
Pilot Officer B. Glassop	VK2BG	A.C.1 Wallbridge	VK2UI
Ft. Sergeant J. Evans	VK2OX	Pilot Off. R. Abbott	VK2YK
Ft. Sergeant J.h. Moyle	VK2EZ	Pilot Off. J. Moyle	VK2JU
R.I. N. Bourd	VK2LJ	Sergeant R. Black	VK2YA
Sergeant C.J. Henry	VK2UR	Corporal B. Dal	VK2XX
Pilot Officer R. Chilton	VK2HC	Corporal K. Williams	VK2Xd
L.A.C. A.E. Peppercorn	VK2AJ	A.C.11 W. Piggott	VK2VM
Sergeant F.J. McLeod	VK2FM	L.A.C. Olofberg	VK2VV
Flying Off. R. Douglas	VK2ON	Ft. Sergeant R. Corthorn	VK2VG
W/O D. Milne	VK2LQ	Pilot Off. M. Meyers	VK2VN
Flying Off. J. Duff	VK2HR	A.C. 1 A. Blair	VK2DX
Corporal E.C. Brown	VK2J	Ft. Serg. A. Fenton	VK2GV
Flying Off. G. Kempton	VK2CI	Sergeant W. Bischoff	VK2LZ

-----xxxxxxx-----

DIVISIONAL NOTES

At the April Meeting of the Executive inactive States were again discussed and it was decided to continue with efforts to put VK5 on its feet again. The work of 7PA in Tasmania was favorably commented upon and it was felt that this Division would again be active very soon.

The Chairman informed the meeting of the progress made by the New South Wales Division in its efforts to establish an Emergency Communication Network in conjunction with the State War Effort Co-Ordination Committee and it was decided to write the States and endeavor to obtain information as to the manpower and equipment that would be available should VK2 prove successful in their efforts.

To date 721 Census Cards have been returned and the various States' totals are as follows:-

VK2.246, VK3.201, VK4.101, VK5.95, VK6.52 and VK7.26

This return must be considered as satisfactory but unfortunately some Members of the Institute have failed to return cards. Remember this, the Service Register will be the strongest evidence possible to place before the authorities when the time comes to ask for frequencies.

-- NEW SOUTH WALES DIVISION. --

The April General Meeting was held at Y.M.C.A. Buildings, Pitt Street Sydney on the 16th.

Discussion centred around a letter from Federal Headquarters suggesting the amalgamation of the Monthly Bulletin with "Amateur Radio". Members generally were of the opinion that the Bulletin was playing a great part in maintaining contact between members and was the reason why the strength of the Division was being maintained after nearly three years of war. Nevertheless it was felt that if the amalgamation would be for the benefit of amateur radio in Australia, it should take place.

The Chairman informed the meeting of the progress made in the negotiations with the State War Effort Co-Ordination Committee, and the formation of an Emergency Communication Network.

Amateurs throughout Australia will regret to learn that Pilot Officer Bill Moore VK2HZ is a prisoner of war in Java.

The next General Meeting of the Division will be held at Y.M.C.A. Buildings Pitt Street, Sydney on Thursday 21st May, and all Amateurs are invited to attend.

XXXXXXXXXX

VICTORIAN DIVISION

The Fighting Forces were well represented at the last meeting of the Victorian Division. Amongst the visitors was WSVHV of Detroit, Michigan, who reported that there were 5000 Hams in the district. Other visitors were VK5KL and VK2XX/9XX.

The morse classes held by the Division are now being conducted on five nights during the week. Monday to Friday inclusive, and the class Manager Mr. H. N. Stevens VK3JO would be very pleased if anyone wishing to act as an instructor would get in touch with him at the Institute F6997.

It is reported that 3YK has arrived back in VK3 after his escape from Singapore and it is hoped that he will be able to attend the next meeting and give an account of his experiences.

3RX..is still pushing ships in and out of port (an obstinate artist's sketch of this would prove interesting.)

3BQ..reported that he had a quiet day--he only ground eleven Xtals. Max is continually installing new equipment which keeps him busy. Is looking for some quartz.

3RJ..Congratulations Ray on the commission.

3BM..I hear is now married. Congratulations Bruce.

3JO..reports that his brother 3OJ has been called up and is with Area Signals, 3JO, thinks that after reading last months notes is of the opinion that the notes editor 3HX has a one track mind. (Gosh Herb I must read the notes to see what you mean.)

3YL..bemoans the fact that the OM has been called up. 3YL is doing a FB job at the morse classes.

3WQ..has a system of 6 or more relays to switch automatically from one RX in the shack to t'other in kitchen using one push button and one wire line to control everything except tuning. A special feature is that Chas can monitor the junior op in the shack by means of a different pressure on the same button!!!

3LQ..is very busy with ARP work - is Deputy Warden of an area.

Ken Ridgway rang up after a hectic trip home to enquire as to the whereabouts of his pants?????. It's quite alright though Ken took the wrong bag by mistake and left the one containing his working clothes.

3HX..received these notes from 3JO, who ends up with "Well that ought to keep you quiet for this month you old-- (and then a lot of stars and such things.) I wonder just what he means????

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VICTORIAN DIVISION**

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Meeting Night—First Tuesday in each month.

**THE WIRELESS INSTITUTE
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VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

**DO YOU WANT TO BE
BACK ON THE AIR?**



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FEDERAL HEADQUARTERS:

BOX 1734JJ, G.P.O., SYDNEY.

NEW SOUTH WALES:

BOX 1734JJ, G.P.O. SYDNEY.

VICTORIA:

BOX 2611W, G.P.O., MELBOURNE.

QUEENSLAND:

BOX 1524V, G.P.O., BRISBANE

SOUTH AUSTRALIA:

BOX 284D, G.P.O., ADELAIDE.

WESTERN AUSTRALIA:

BOX N.1002, G.P.O., PERTH.

TASMANIA:

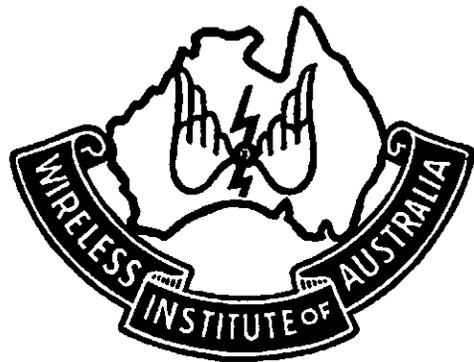
BOX 547E, G.P.O., HOBART.

SIXPENCE

JUNE 1942

AMATEUR RADIO

THE
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WIRELESS INSTITUTE
OF
AUSTRALIA



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SHORT-WAVE SERVICE INTERRUPTIONS.

-- Time Lost Through Ionosphere Storms --

.....

The Short radio waves are the most useful for communicating over great distances because they travel with relatively little loss from transmitter to receiver by way of the refracting layers of the ionosphere, and so escape the effect of ground absorption. Successful communication is however, dependent upon the existence of normal conditions in the ionosphere layers. Normal changes which occur there are taken account of by the changing of the transmitter frequency at suitable intervals. There are also certain abnormal occurrences such as sudden ionosphere disturbances and ionosphere storms which may cause interruptions.

Sudden ionosphere disturbances usually do not last longer than about 1 1/2 hours, but an ionosphere storm may last ten days or more, so that it can be regarded as the principal cause of service interruptions.

Examination of statistics shows that there were 57 ionosphere storms during 1940 and of these 18 were probably severe enough to cause deterioration in reception in certain parts of the world even when using elaborate receiving equipment. Actually, receiving conditions could be said to be normal on only about 80% of the total days of the year. Of course, not all SW routes are affected by all ionosphere storms so it is probably that only in the worst cases was reception affected for as much as 20% of the total time. Signal paths running in southerly directions, for example, would be affected considerably less than this. March was the month with the greatest amount of disturbance.

The year 1940 was slightly better year than 1939, which may have been due to the fact that there was less sunspot activity in 1940. It is almost certain that the agency which causes the ionosphere storm is an emission from the sun. In addition to causing ionosphere disturbances, this emission often causes abnormal fluctuations in the terrestrial magnetic field.

The general effect of an ionosphere storm is to cause a

disturbance and afterwards an expansion in the ionosphere layers, so that the amount of ionisation per cent of space is reduced. Thus the radio wave does not encounter sufficient ionisation to effect refraction, and so it passes right through the ionosphere and on into space.

If the transmitting frequency were lowered when the layer ionisation were reduced, refraction would again take place, but it has been shown that in severe cases a reduction in frequency of about 30% would be necessary. Owing to the fact that the lower layers of the ionosphere are only slightly affected by a storm, lowering the frequency would also have the effect of increasing the absorption to which the wave is subject, because the main source of absorption is in the lower layers. Thus whilst lowering the frequency would improve the refraction in the upper layers, the signals could not be so strong as on normal days, because of the incidental increase in lower layer absorption at the lower frequency.

-----oOo-----

The following is part of a letter received from Eric Trebilcock, VK5TK:-

Well, here I am in VK4. Was in Salamau, N.G. Oct 40-Jan 42. Was blitzed there Jan 21st., blasted out into jungle for seven days trek in the worlds worst jungle up to 7,000 feet from sea level. Finished up at an inland joint to get two more hefty bombings. Was there a week when a Moth aircraft rescued me and flew me across enemy occupied skies to the southern coast where I saw much evidence of a visit from the enemy two hours before. Thence by air to somewhere in Queensland across 800 miles of ocean to safety.

January 21st to February 5th was the most hectic of my life. Three times bombed without being able to give back some curry. Saw mates killed etc. (I was one of the lucky ones.)

Did five weeks at Townsville radio thence to here, where I am more or less permanently (??) put.

• The YL came from Clovelly - we now are "OM-XYL".

This is as far south as the Dept. have let me get so far -- lord knows when I'll see Sydney, let alone my old Adelaide (hi!). I tried to join the R.A.A.F. nearly three years ago - ditto A.I.F. Got wiped off cos of my most essential job hi! Nowadays am prevented by law from joining up. My dreams of G-VE and D remain wishful dreams.

73's

Eric Treb. VK5TK.

- 3 -

THE MIRROPHONE

In a recent issue of the Wireless World a description is given of the Mirrophone and the following information has been taken from the article mentioned.

As most readers will know there are three main methods of recording sound, mechanically on wax; photographically on film and magnetically on steel wire or tape. The last has not achieved the wide popularity of the other methods, in spite of the advantage it offers as compared with most other systems--of immediate play back. Unlike the film or the commercial wax recording the steel tape requires no processing and retains its impressions almost indefinitely.

Thanks mainly to this feature of immediate play-back, a suitably designed magnetic recorder would appear to have special advantages for certain specialised uses, and it is not surprising to learn that a compact unit, combining provision for recording and immediate play-back has recently been produced. The Mirrophone, as it is called, employs the normal principles of magnetic recording and uses a steel tape which, as compared with a wire, can easily be prevented from twisting, and permits of transverse recording.

Housed in a small cabinet is the recording-reproducing unit, an amplifier and loud speaker. Associated with this unit is a high-fidelity crystal microphone. The thin narrow tape on which the recordings are made is mounted on drums which rotate to draw the tape between the poles of the recording magnet. To allow the tape to repeat without rewinding, its ends are welded together to form an endless bolt. The material of the tape is a special magnetic alloy recently developed by the Bell Telephone Laboratories.

In reproduction and recording magnet serves as the pick-up device. These magnets are removable with plug in connections. The dynamic loud speaker is supplied by a two stage amplifier which develops exceptionally high gain. An acoustic chamber encloses the back of the speaker. Its field coil also serves as a smoothing choke for the amplifier anode current supply.

Alternating current from any normal source of supply operates the Mirrophone. A volume control regulates the intensity of the recording or the reproducing currents; and an electronic volume indicator shows when the level is correct for recording. To indicate the length of the recording there is a movable pointer which makes one complete revolution per minute and can be reset at any time.

A record once made can be reproduced as often as desired and kept indefinitely or until the switch is again thrown to the recording position. Doing so automatically clears the tape as it passes the polarising magnet and prepares it for a new record. The switch

also has a stand-by position which leaves the tape running, but disconnects the erasing, recording and reproducing units. An output jack permits connection to an external loud speaker or another recording machine when permanent records are wanted.

Best quality recordings are obtained when the speaker is close to the microphone, but the results are entirely satisfactory from greater distances. Group conversation can be picked up when the speakers are several feet away. Intelligible recordings have been made in large auditoriums with the sound source many feet from the microphone. On the other hand, whispered words can be reproduced loud enough to be heard by all present in a large auditorium.

In the Mirrophone, instructors in voice training have an effective new tool. Public speaking classes and music schools should find it helpful in developing good diction and correcting faulty technique in the rendition of vocal and instrumental music, for it has the great advantage of permitting a student to hear his own efforts as others hear them and to listen critically to the faults which his teacher wishes to correct.

As a lecture demonstration for talks at expositions and conferences, it has the advantage of being able to reproduce recorded speech immediately and of preparing itself automatically for a new record. The Mirrophone is also effective aid in teaching the correct pronunciation of foreign languages. For the first time those interested in cultivating the voice and studying instrumental music have in the Mirrophone the opportunity of critically reviewing and surveying their own performances without any appreciable time-lag.

.....

SLOUCH HATS and FORAGE CAPS

Well, well....I nearly made a mistake and admitted something, forgetting that these days one admits nothing....at once. Hi! So, now, where are those paragraphs about what the VK Hams did, Overseas???????. There being roughly 2,000 hams in VK I expect 200 letters in the next couple of months. Meantime, "here is the News".....

At VK3 RAAF Hq. receiving staff officer in charge is Jim Martin, and also there is Max Cumming 3XN. Max is just back from Singapore and is one of my prospective reporters....I hope. I gather he had a "nico" interesting time. He was with 21 Squadron and was bombed daily, from the first day until he left....they must have known he was a Ham Hi. He was operator in a mobile

tender attached to the squadron and they kept the gear in one piece all the way back to Singapore. On the first day one hit their sleeping quarters....the lads luckily being in their slit trench....but all 3XN's gear dissappeared plus a brand new radio he had just purchased....hope they have a War Damage Commission in Malaya, om....call it a HRO if they have, HI. Finally the Squadron reached Kuala Lumpur, without any planes to fly with, so Max left the Radio truck and with some of the boys grabbed a car left behind, and with a HMV Console to keep the rear down, drove back to Sombawang in style. After doing a bit of fighter control on loan to another squadron they were ordered out to Sumatra about a week before the final battle. While in the port prior to sailing the Japs staged a "blitz" and sunk the ship in front, and the ship behind theirs. Arriving in Sumatra, there were no planes to fly, so they left for home, just a couple of days before the Japs landed paratroops on the dromo.

Another welcome returner to VK3 was Staff Sargent Jim Hourigan 3SG. Jim returned from the Middle East and has told some very interesting stories that as pertains to hams make ones mouth water. The Radio of all descriptions lying around Tobruk when the Aussies drove out the Axis forces was nobody's business...what a pity it was so far from home. Jim was with the Field Workshops and saw a good deal of all that happened in Libya. His comparisons of the gear used by English, Americans, Italians and Huns are very interesting. How about an article on it, om. By the way 3SG is thought to be in VK2, and if so we would all like to see him.... how about it, om?

From what 3XN says practically all the Australians with the R.A.A.F. got out of Malaya and Java, but those attached to R.A.F. units were not so fortunate. Among those besides 2HZ, were F/O Arthur Finkler 3ZV, and F/O Roy Prowse 3XS. Anybody know of any others?

SKQ has been on a Mine Sweeper for some time, but is now back at an R.A.E. W/T Station in Melbourne. George was married just before Xmas. At the rate they are getting married, there won't be any single Hams on the air after the War, Hi. Motto is, buy your gear beforhand, oms.

in VK3

Out at R.A.A.F. Station/there seems to be the "usual" ham gathering.

In charge of station signals is 3WH...in charge of the Xmitters is 2AGL...the Instructional Staff contains F/Sargt. 3DW and Sargents 3BG, 3VS, 3UG and 5BK. 7RZ is also there as L.A.C. Trainee W.A.G. and 3AB is ACI Trainee Op.....I hope you latter two got "all the dope" from the galaxy of Hamdon above. HI.

Over the page here at 2YC and that is all I am allowed these days of "rationing." But just one more remark....just in case....

"if anybody says to you I have news left over and that they sent me some....well, there is a war on, and so the statement is neither denied or confirmed from SH and FC HQ as they say in better communiques than mine. And that's what I thought of just at the beginning.

2YC.

.....

ON ACTIVE SERVICE

Herewith a list of Victorian Amateurs on Active Service compiled from Cards returned to Federal Headquarters. If you are on Service and your name does appear on this list, kindly ^{not} furnish full particulars to Federal Secretary, 21 Tunstall Avenue, Kingsford, N.S.W. as soon as possible.

R.A.A.F.

A.C.1.	G.M. Hull	VK3ZS	Corporal	P.J. Anderson	VK3PA
L.A.C.	J. Stevens	VK3ZK	Ft. Sgt.	G. Tompton	VK3OW
A.C.1.	E.H. Martin	VK3ZF	A.C.1.	G. Daniel	VK3NX
Sergeant	F.G. Bail	VK3YS	A.C.1.	A.H. Nicholls	VK3NI
P.O.	G.C. Douglas	VK3YK	A.C.1	M. Campbell	VK3MR
A.C.1.	F.W. Hand	VK3YH	Sqd. Ldr.	R. Cunningham	VK3ML
Sergeant	L.W. Johnson	VK3YF	P.O.	W.J. Scarff	VK3KO
L.A.C.	I. Stafford	VK3XB	L.A.C.	S.J. Wilcox	VK3KC
Ft. Serg.	R. Prowse	VK3XS	Ft. Sgt.	N.N. Tompton	VK3HG
A.C.1.	R.E. Humphreys	VK3WO	Sgt.	H.D. Ward	VK3HD
Sergeant	A.W. Chandler	VK3WH	Sergeant	H.G. Williamson	VK3GW
Ft. Lt.	W. Gronow	VK3WG	A.C.1.	W.A. Fulton	VK3EW
Corp.	W.D. Mather	VK3WD	P.O.	J.K. McCarthy	VK3EX
Corp.	C.R. Nelson	VK3WC	A.C.1.	D.E. Briggs	VK3FU
Sergeant	A. Evans	VK3VQ	Sergeant	B.M. Ferguson	VK3FN
L.A.C.	N. Serpell	VK3UV	Sergeant	H.F. Huon	VK3FH
A.C.1.	V.L. Smith	VK3UR	Corporal	R.J. Bell	VK3EK
Sergeant	N. Foxcroft	VK3UQ	Sergeant	T. Baker	VK3DK
Corp.	D.A. Norman	VK3UC	Corporal	A.W. Giddings	VK3DG
A.C.1.	S.I. Zounert	VK3SZ	P.O.	A.G. Brown	VK3CX
L.A.C.	B. McCubbin	VK3SO	A.C.2.	C.K. Shenfield	VK3CK
Sergeant	W.G. Sargent	VK3SC	Sqd. Ldr.	J.W. Reddrop	VK3BN
P.O.	R.E. Jones	VK3RJ	Sgt.	Roth Jones	VK3BG
L.A.C.	J.G. Colley	VK3QZ	A.C.1	A.H. Miller	VK3AH
			A.C.1.	J.W. Leonard	VK3AB

ARMY.

Sergeant	P. Thornley	VK3PE	Lieut.	J.C. Hour	VK3OE
Lt. Col.	S.A. Embling	VK3DC	Gnr.	J. Watson	VK3IQ
Corporal	G.C. Mikkolson	VK3XV	Private	J.W. Ballinger	VK3NK
Lieut.	J.K. Tutton	VK3ZC	Sglnm.	H.R. James	VK3LH
Lieut.	C. Woodward	VK3YO	Lieut.	D.R. Ayre	VK3KP
Lieut.	A.G. Woynton	VK3XU	Lieut.	T.P. Kirby	VK3KI
Sglnm.	R.R. McGregor	VK3XZ	Corporal	J.M. Mabbitt	VK3JG
Lieut. Col.	R.P. Whalley	VK3WZ	Sglnr.	R. Ford	VK3IQ
Lieut.	W.L. Nye	VK3WL	Gnr.	A.L. Maguire	VK3LO
Corporal	W. Dudman	VK3VY	Major	H.R. Hunter	VK3FV
Lieut.	A.H. Clyne	VK3VX	Sglnm	D.G. Butt	VK3HT
Lieut.	V.J. Spicer	VK3VS	Major	P.E. Dunne	VK3HP
Lieut.	W.H. Laurenceo	VK3VH	Corporal	J. McCandlish	VK3HM
Private	B. McKenzie	VK3VF	Corporal	P.R. Gibson	VK3GX
Corporal	C.M. Barnett	VK3VD	Corporal	A.T. Gooby	VK3GV
W/O	W.T.S. Mitchell	VK3UM	Sergeant	A.J. Shileds	VK3GP
Private	C.A. Goddon	VK3TI	Major	G.E. Every	VK3GE
Sglnr.	L.S. Dixon	VK3TE	S/Sgt.	G.R. Carter	VK3GC
Sergeant	K.V. Scott	VK3SS	Sergeant	K.F. Chick	VK3FV
S/Sgt.	J.B. Hourigan	VK3SG	Corporal	G.L. Smith	VK3FR
Corporal	S.W. Widgery	VK3SE	Corporal	E. Foot	VK3EH
Sergeant	T.E. Evans	VK3RK	Captain	I.V. Miller	VK3EG
Sglnm	W.J. Bridge	VK3QV	Corporal	G.B. Lanco	VK3DS
Capt.	R.K. Roseblade	VK3QJ	Sglnr.	J.P. Brogan	VK3CG
Sglnr.	F. Rowley	VK3QF	Sergeant	G.S. Hanham	VK3BJ
Sglnm.	A.C. Zander	VK3PG	Lieut.	A.C. Lord	VK3BE
Sglnr.	C.I. Slade	VK3PZ			

NAVY.

W/T	L.C. Raebel	VK3HI	W/O	N.E. Gunter	VK3NG
Telght.	H.B. White	VK3IE	2nd W/O	R.P. Veall	VK3PV
L/T	G.T. Bonwell	VK3KQ	R.O.	F.W. Bond	VK3SQ
Sub. Lt.	D.J. Modley	VK3MJ	R.O.	R.R. Thompson	VK3UF
W/T 3	K.G. Allen	VK3UH	R.O.	R.E. Slutzkin	VK3SK
C.R.O.	L.C. Rogers	VK3LI			

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

- Federal Headquarters -

As mentioned several times in these notes, Federal Headquarters has been perturbed regarding the inactivity of Divisions in the smaller States, and several suggestions were made as to ways and means of keeping the members of the Divisions concerned in contact with the Institute. The main difficulty with the States, namely south Australia and Tasmania, was in maintaining continuity of Office Bearers due to Service calls.

Federal Headquarters, as at present constituted, consists of Amateurs engaged in Reserved Occupations and therefore continuity of Office Bearers can, to some degree, be guaranteed. It was decided to make available to the States concerned - should they so desire - the services of the Members of the Federal Executive. Tasmania has made a request that F.H.Q. take over their Members and this will be done by enrolling them in the Wireless Institute of Australia - a body whose Office-Bearers will be members of the Federal Executive.

As a result of the questionnaire forwarded to all Divisions regarding the Emergency Communication Network, it now transpires that VK6, VK7, VK4 and VK2 were all working along the same lines, but New South Wales was the only Division to inform F.H.Q. of their action. Whilst the actions of the various States in endeavoring to prove the worth of Amateur Radio in an Emergency is to be commended, it must be realised that if - through Federal Headquarters - each State is aware of the happenings in another, more impetus can be given to the movement. It is not a question of New South Wales or any other State's hams being on the air, it is really Australia, and every State should be prepared to help the other and forget that such things as prefix areas exist - - other than for purposes of identification.

Mr. Neal Gough, VK2NG, has been elected to the vacancy existing on the executive caused by VK2AJQ's call up.

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NEW SOUTH WALES DIVISION.

The Monthly General Meeting of the Division was held as usual at Y.M.C.A. Buildings, Pitt Street, Sydney on Thursday 21st May.

The Chairman, in declaring the Meeting open extended a welcome to Bill Wishart VK4WT and Flight Sergeant Jim Perooz VK2PE.

The proposed amalgamation of the Monthly Bulletin with Amateur Radio was discussed, and members were of the opinion that the suggestions made by the Magazine Committee would have to be modified before the amalgamation took place. This matter was eventually left in the hands of a sub-committee.

The Chairman gave a short resume on "Panoramic Tuning" as set out in "Q.S.T." and all present decided to put it into operation in the first DX Contest after the war!

Members were informed of the progress made with the proposed Emergency Communications Network and it is anticipated that a decision will be made by the powers that be, very shortly.

Jim Perooz gave a short description of some of the Radio Gear he had seen in enemy planes shot down in the Middle East. Look out for a high power station after the war chaps. Contest committee's, please note!

Laurie Williams, 9WL, now resident in VK2 elected to the State Council to fill VK2AJ0's vacancy.

VICTORIAN DIVISION.

We are still wondering just what happened to the Gang from AHQ Signals who were supposed to turn up at the monthly meeting complete with some gear to give us a demonstration of army technique. With rather a representative gathering present it was unfortunate that they couldn't get along. The reason for their absence, is at the moment, clouded maybe they just couldn't make it.

In their absence it looked as if the evening was going to fall rather flat until Jack Coulter VK3MV, who was on leave from the Navy told us of his experiences when they went into action on February 19th, somewhere in the north.

Following this, one of our American visitors W6ROO, who hails from San Francisco, filled up the rest of the evening with a particularly humorous account of how he got started in Amateur Radio, which kept the gathering in gales of laughter.

Other Ham visitors were W2NDJ, W2JFY and W6PBO who made his second appearance.

3EF...was down from the country and paid us a visit. Bert says that he is down on business, but may be a R.A.A.F. man before long.

30J...managed to get leave from his sigs unit in the hope of seeing some gear.

3JO... still runs the morse classes...Herb recently had the common complaint...'flu'...After viewing one of the class students, I still think Herb is in danger.

3RN...when seen recently looks very snappy in uniform...It's a wonder that the YF lets Ron out alone.

3NY...after having the parts of a set for over twelve months decided to build it but...the chassis didn't suit .

3GY...attended the meeting in the hopes of seeing the gear.

3VH...is reported to be back from overseas.

3IR...a member of the navy is also reported to be back.

.....

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VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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BOX 1524V, G.P.O., BRISBANE

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BOX 284D, G.P.O., ADELAIDE.

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BOX N.1002, G.P.O., PERTH.

TASMANIA:

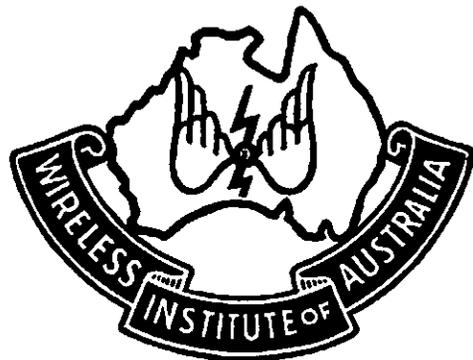
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SIXPENCE

JULY 1942

AMATEUR RADIO

THE
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OF
AUSTRALIA



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July 1942.

FANTASOUND

This article is taken from a description published in The Wireless World, of some of the equipment used for the stereophonic sound effects in Walt Disney's film, "Fantasia."

In this film, sound is not so much the accompaniment as the starting point of the ideas expressed in the animated colour cartoons shown on the screen. Special equipment was sent from place to place with the film and auxiliary loud speakers were installed to handle the large sound output, and to ensure correct balance for the stereophonic effects.

The raw materials, to speak, from which the final sound tracks were composed, were drawn from microphones distributed at strategic points throughout the body of the orchestra. After much testing, eight simultaneous recordings were finally made with microphones at six points in the orchestra and two others as follows:- (1) Violins, (2) Violas, (3) Brass (4) Cellos (5) Wood Wind (6) Percussion (7) Mixed output from whole orchestra (8) Microphone pick-up at a distance from the orchestra. The last two sound tracks provided what might be termed first proofs of the recording. These were examined critically by the conductor, and if the efforts of his players fell short of his ideas of what the music required, adjustments were effected when the final sound tracks were made up from the six primary channels arriving from different points in the orchestra. These were combined into three tracks associated with the centre, left and right hand group of players, and when reproduced through loud speakers similarly placed in the space behind the screen, gave the effect of auditory perspective obtained from listening to a real orchestra. With the help of extension speakers arranged around the auditorium, the audience were at times made to feel that they were in the midst of the players themselves.

Obviously some of the illusion would be lost if the volume range of the orchestra, normally about 70 db. were restricted to the accepted limit of 35 db. for variable area recording. Accordingly, a system of automatic volume

expansion was introduced and a fourth sound track was employed to control each of the three main sound tracks. The latter were of double width which increased the available range to 41 db. Nevertheless, to be quite sure that the film noise due to gain and scratches should be at all times completely suppressed, it was decided to limit the recording range to 25 db and each sound channel was passed through a volume compression circuit which kept down maxima and brought up minima within those limits. The automatic fluctuations of bias in the compression circuits were made to modulated fixed frequencies which were recorded simultaneously as a complex tone on the fourth track. In playing back the record filters separated the three control frequencies (250, 630 and 1600 c/s) and after rectification the variations of amplitude were applied as control bias to the variable gain amplifiers at the head of each amplifying channel.

The four sound tracks occupy the full width of a standard 35mm film which is printed quite separately from the picture. The sound film is run through a separate machine, which is synchronised with the picture projector by means of a master three-phase generator and separate "Selsyn" motors. In the special sound head which has been developed for this purpose a single reversible exciter lamp is provided which enables the spare filament to be brought into action merely by reversing the lamp in its socket. The light is formed into a beam one mil. wide and of a length sufficient to scan all four tracks. As the light covers the whole width of the film, the standard rotary stabiliser and solid take-off drum could not be used, and a special scanning aperture in conjunction with a magnetically driven drum was employed. The scanning light, modulated after passing through the film passes into the four separate photocells housed together with their matching transformers in a compartment on what would be the front of the machine if it were a picture projector.

After passing through the usual operator's fader control relays, the output from the three main sound tracks goes via pre-amplifiers to the main amplifier channels. The complex control tone is amplified separately and applied to each of the variable gain amplifiers associated with the main channels where the appropriate tone is selected by a band-pass filter rectified, smoothed and applied as bias to the amplifier. The control stage consists of two 6K7 valves in push-pull and manual control of the expansion characteristic is available in order that the overall volume range may be adjusted to suit the size and acoustics of individual theatres.

The power output available from each of the main channels is 120 watts, and this is absorbed by two of the standard R.C.A. multiple loudspeaker units. These units each consist

of two HF "tweeters" feeding into cellular horns and four large diaphragm speakers loaded by re-entrant horns. Separate 50 watt amplifiers taking their input through attenuator pads from each side channel feed 22 small cabinet speakers arranged along each side of the theatre. Actually the amplifiers rated at 120 watts are each capable of delivering 200 watts with only 2 per cent distortion, so that in practice, a total of 700 watts distributed through 80 speaker elements was available at the first showing of the film in New York. This power is, of course, in reserve for climaxes in the music, and will not always be used in the smaller theatres to which the full stereophonic equipment is taken.

In addition to the specially combined single sound track which has been printed for standard equipment there is another simplified version of "Fantasound" which retains the volume expansion feature, but not the stereophonic effects. In this the control track is printed in the spaces between the sprocket holes at the edge of the film, and is used to vary the strength of the 96 cycle current produced by the sprocket holes themselves. A variable gain amplifier is introduced in the chain leading to the screen loud speakers, and additional house speakers are brought in to handle climaxes, the amplifier feeding them being normally biased to cut-off. This system seems very promising for screen plays where dialogue can be confined to the central loudspeakers, the side speakers being brought in only for music or special effects.

One way or another the film "Fantasia" has created a stir of the first magnitude, and while critics may wrangle over this or that aspect of the association between art and music, the significant thing from the technical point of view is that stereophonic sound is being given its first commercial trial.

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THE NEW IMPROVED AMATEUR RADIO

With the co-operation of the New South Wales Division the Magazine will take new form as from the next issue.

It has been decided to incorporate into Amateur Radio the New South Wales Divisional Bulletin, and to increase the number of pages to fourteen.

We apologise for this issue being very small, as with the re-organisation of the magazine, various details were held up with the result that we were short of copy.

ON ACTIVE SERVICE.

Hereunder a list of Queensland, Sth. and Western Australian and Tasmanianhams on Service, compiled from cards returned in the Federal Census. If you are on Service and your name does not appear on this List, kindly forward full particulars to the Federal Secretary, 21 Tunstall Avenue, Kingsford, N.S.W.

QUEENSLAND.

SOUTH AUSTRALIA.

Captain	J. Foldi,	VK4KT	Army	Pte.	P.R.Keddie	VK5KZ	Army
Lieut.	C.E.Burns	VK4ZY	"	Corporal	J.G.Phillips	VK5BW	"
Sgtnmn.	W.G.Clayton	VK4WG	"	Pto.	J.P.Sullivan	VK5JK	"
Corporal	J.Halyday	VK4HZ	"	Lieut.	E.A.Charles	VK5YQ	"
L/C	A.Johnson	VK4PX	"	Lieut.	R.T.Manuel	VK5RT	"
Lieut.	H.Wooster	VK4VH	"	Corporal	R.Anthony	VK5CM	"
Gnr.	G.H.Gray	VK4JP	"	L/Corp.	H.J.McCarthy	VK5MC	"
Corp.	M.J.Wratten	VK4MW	"	Corp.	G.F.Lucas	VK5LL	"
Corp.	J.Jackson	VK4CN	"	Tel.	J.Fairweather	VK5FV	Navy
Sppr.	H.Dearness	VK4KW	"	WT/3	J.A.Scriven	VK5SN	"
Major	J.Love	VK4JL	"	R/O	R.D.Elliott	VK5KD	M/Ny
Corp.	T.Hawson	VK4CH	"	A.C.1	R.J.Townsend	VK5HT	RAAF
Sgt.	K.Schleicher	VK4KS	"	Sgt.	F.Holsten	VK5LK	"
Sgtnmn.	E.H.White	VK4EW	"	Sgt.	J.Kilgariff	VK5JT	"
Lieut.	G.Harley	VK4GH	"	Sgt.	R.Harris	VK5FL	"
Lt.Col.	R.H.Sainsbury	VK4YJ	"	L.A.C.	H.K.Stacey	VK5XA	"
S/Sgt.	A.E.Carter	VK4LT	"	Sgt.	H.Hobcroft	VK5RE	"
Lieut.	J.F.Heine	VK4JX	"	Sgt.	W.L.Heinrich	VK5HR	"
Tlgrpht.	C.W.Marley	VK4CJ	Navy	A.C.1	F.Bourne	VK5BU	"
Tlgrpht.	C.McCouchman	VK4KZ	"	Sgt.	C.A.Ives	VK5AF	"
WT/3	S.R.Baxter	VK4FJ	"	P/O	J.Allan	VK5UL	"
Tel.	F.Lubach	VK4RF	"	A.C.1	R.W.Davey	VK5KD	"
R/O	E.Delmar	VK4XZ	M/Nvy	A.C.1	M.Anderson	VK5MA	"
Corp.	A.K.Bradford	VK4KK	RAAF	L.A.C.	P.Davoren	VK5KM	"
Corp.	A.H.Tilse	VK4WO	"	L.A.C.	H.Green	VK5OJ	"
A.C.1	J.R.Martin	VK4MX	"	A.C.1.	A.Phillips	VK5GX	"
Sgt.	J.Allan	VK4AN	"	A.C.1.	J.W.Shield	VK5ZZ	"
Corp.	E.R.Ashlin	VK4EA	"	Sgt.	J.A.Smith	VK5JR	"
Corp.	J.Makin	VK4OK	"	A.C.11	L.W.Wallbridge	VK5UX	"
A.C.1	K.Karppinen	VK4KN	"	Ft.Lt.	L.A.Deane	VK5LD	"
F/O.	A.E.Walz	VK4AW	"	L.A.C.	H.V.Lunn	VK5HL	"
A.C.1	J.Harvey	VK4NA	"	L.A.C.	C.A.Ferguson	VK5CJ	"
P/O	H.W.Wheeler	VK4A	"	Corp.	R.K.Deane	VK5RK	"
R/I	T.Alexander	VK4TA	"	Sgt.	A.Sutherland	VK5XB	"
				A.C.1.	E.L.Andrews	VK5EL	"

WESTERN AUSTRALIA.

Corporal	C.H.Reeves	VK6?	Army	Sgt.	E.Robins	VK6RB	RAAF
Sgnlmn	K.S.Anderson	VK6KS	"	Corporal	A.F.Wahl	VK6JB	"
Sgt.	K.Stitfold	VK6?	"	Sergt.	G.Heindricks	VK6RF	"
Sgnllr.	L.J.Symonds	VK6LS	"	Sergt.	A.Foxcroft	VK6AF	"
Lieut.	E.Grey	VK6ZX	"	Tlcpst.	E.Potts	VK6ZO	Navy
Corp.	J.Grogan	VK6EI	"	L.Tel.	W.J.Sperring	VK6SP	"
Sgt.	G.W.Ashley	VK6GA	"	Lieut.	R.L.Devitt	VK6DR	"
Sgt.	J.W.Thomson	VK6TM	RAAF	P/O Tel.	C.A.Young	VK6CY	"
Sgt.	R.C.Growther	VK6CC	"	Tel.	E.R.Pearce	VK6TP	"
Sgt.	J.E.Goddard	VK6JG	"	Tel.	I.Ginbey	VK6IG	"
A.C.l.	V.H.Harris	VK6NL	"	Tel.	A.M.Rippen	VK6GR	"
L.A.C.	F.H.Wright	VK6FR	"	<u>TASMANIA</u>			
A.C.W.	Ruth Harris	VK6YL	"	Sgnlmn.	G.Richardson	VK7GR	Army
F/O	W.Weston	VK6WM	"	Sgnlmn.	R.H.Kilby	VK7RK	"
W/O	J.Reid	VK6BE	"	Corporal	H.Hopwood	VK7GJ	"
Corp.	E.Langenschied	VK6EL	"	Sgnlmn	H.D.Spence	VK7DS	"
Sgt.Pl.	W.Sands	VK6BS	"	Lieut.	T.Connor	VK7CT	"
A.C.l.	R.Collis	VK6LY	"	A.C.l.	C.J.Robinson	VK7KR	RAAF
F/O	S.Madden	VK6MN	"	A.C.l.	K.Saxon	VK7ER	"
Sgt.	W.J.Lewis	VK6YB	"				
A.C.l.	J.Gabbertas	VK6GB	"				

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SLOUCH HATS AND FORAGE CAPS

Another month gone and once more, thanks to my few never-failing correspondents, we hope to fill this page.

Our first news concerns VK3RJ, and when I get my job with the big evening newspaper, I'll report it like this..Dastardley and unprovoked attack on Federal QSL Bureau...Valuable WIA Officer Loses Sleep...."From our Special Correspondent at an Eastern Capital we learn that one night recently a passing "visitor" fired a dozen or more shots of 6 inch calibre at our sleeping QSL Officer, etc. etc..." What's so important about that you want to know?...well, they MISSED...sitting shot and all, and their best was 150 yards off...and no wanting to be Fed QSL Officer...wouldn't it??????. And now he sleeps "under" the bed.. so I hear on unconfirmed authority. As he only woke up to hear the last shot, it may be right. Hi!

Roger Torrington VK2TJ...back from "Our North West" gave us a very enjoyable night at NS^W Div., Meeting, explaining Jap. Raids on 2NO's old town. The highlight of the piece, to my mind, was about the second raid. After the first one, before which,

of course, A la Australian, there were no shelters, etc., the lads decided to construct personal dug-outs of 44 gallon drums sunk into the ground and sandbagged around the top. But though these appeared very nice and safe before raid number two, with the approach of the bombers they appeared far too close to the buildings, and the scrub 300 yards away a far more desirable spot. Roger says that great minds really do think alike, for, as he scrambled out of his, all the others were doing likewise. With the roar of bomber engines behind them, the pace towards the sheltering scrub was a cracker, every nerve being strained so as not to be last. Suddenly, from over the rise just behind the scrub, very low and heading straight towards the speeding personnel, shot four Zeros. Roger definitely assures me that the human frame though propelled by any amount of speed, determination, avairdupois or anything else, head first, tummy first, or what have you, cannot, like the armadillo, dig a hole in the earth and disappear out of sight of approaching Zeros. Our young Ham, realising this, quickly turned at right angles to the line of flight and simply "flow" into the scrub. Sounds a bit "fast" to me, but that's what Roger said.....more or less.

W3ERP is "holidaying" over here with us. He was a ten metre phone lad, so perhaps some of you know his sigs. His QRA was in Philadelphia and just now he is Op on an Army Transport. He was at our Divisional Meeting and spent Sunday with 2TI....a swell guy, oms, as they say in God's Own Country.

Getting the Federal atmosphere and listening to 2EO "on Dx"are some other Ws we hope to meet before they get back home. Some of them are...W5FPX...Gail Gibbs hails from Little Rock... Arkansas, and also has a first Class ticket. Works for both U.S.N. and R.A.N. and can spin plenty of Yarns about Pearl Harbour... (Can we hear them, or must we wait till "after"?) Other pastimes are...eating American Peanuts, entertaining YLs...and sending the Weighing Machine indicator "far from Zero."

W7LQ...Jimmy is an oldtimer on the air, but it is some time since he called CQ from Washington as he has been at sea around K7 land since about 1933.

W6RBA/W9QCV...Jerry originally hails from Milwaukee, Wisconsin, but last operated from Santa Anna California. Jerry was one of the lucky ones who escaped injury at Pearl Harbour (what another story this column has to wait on????).

W2HPT...Edwin hails from Fort Tee, New Jersey, and is just getting used to VK...its easy om, everybody is glad to have you here.

Lastly to quote "VK4RY..."I'm sure all VK's will join in

wishing all visiting W's, particularly the above mentioned, all the best, and may it not be too long before we are once again chowing the rag across the Pacific.

Sorry there is nothing in the page this month, but I yielded to the temptation to tell you about Roger...but it doesn't sound near as good as he tells it. I have more VK news but it will have to stand over till next month.

2YC

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FEDERAL HEADQUARTERS

The monthly Meeting of the Federal Executive was held as usual at Y.M.C.A. Buildings, all Members being present. Chairman extended a welcome to Mr. Neil Gough VK2NG upon his election to the Executive upon the resignation of Mr. A. Joscelyne VK2LJO.

General regret was expressed at the lack of news from VK5 and it was decided to put the same scheme into operation in that State as was being done in VK7.

Census cards still continue to come along in ones and twos, and the total number received is now approaching 300. Divisional Secretaries are asked to make every endeavor to see that their members return the cards irrespective of whether the ham concerned is on active Service or otherwise.

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NEW SOUTH WALES DIVISION

Two very interesting visitors, Herman Gotzel W3ERP and Roger Torrington on VK2TJ were present at the June General Meeting of the Division held at Y.M.C.A. Buildings on Thursday 18th June.

Members were very interested to hear of W3ERP's hamming in pre-war days. Herman received quite a surprise of the amount of knowledge displayed by VK's of American gear, particularly tubes of more than 50 watts plate dissipation. Roger Torrington VK2TJ enthralled listeners with a bomb for bomb description of the raid on Wyndham some time ago, and it is understood that Roger's time for the hundred is now in the world record class!

The Chairman gave members details of several tests he had been present at, in connection with the State War Effort Co-ordination Committee but stated that as yet no word had been received from the Naval authorities regarding the use of U.H.F. Bands for the auxiliary scheme.

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VICTORIAN DIVISION

Members of the Victorian Division are notified that the Annual General Meeting will be held at the Rooms 6th Floor 191 Queen Street, Melbourne on Tuesday, 4th August at 8 p.m., when it is hoped that there will be a good muster.

The business of the meeting will be:-

1. To receive and adopt the minutes of the last Annual General Meeting.
2. To receive the President's Address.
3. To receive and adopt the balance sheet.
4. To elect a President.
5. To appoint an auditor.
6. General Business.

Nominations for Council must be in the Secretary's hands not later than Thursday July 23rd 1942.

Nomination forms, which are enclosed in the magazine must be signed by both the nominator and seconder, and also by the nominee. All must be full members, financial at 30th June.

R.A.C. Anderson - Secretary.

...

At the last general meeting members of the Army Headquarters Signals under the leadership of Major Chippindal 3VU, were present together with sundry experimental gear. Staff Sgt. Scott, 3SS; Sgt. Williams 3WE; D. Bowie 3TC; G. Trythall 3DA; R. Day 3RD; G. McGowan 3GO; J. Duncan 3VZ; M. Johnson; W. Pitts; J. Boatcoal; C. Falvey; and others were amongst the visitors.

It has now been learnt that Snow Campbell 3MR was badly injured in a plane crash prior to his capture, and has been in rather a bad way. However, the latest news is that he is now rapidly regaining health and strength.

Congratulations to Gavin Douglas 3YK who was married recently. We're still waiting to hear something of your adventures OM.

Major H.L. Andrews 3HY, who was attached to Medical Services is the latest to be reported missing presumably in the Malayan Campaign.

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HAMADD

3RX wants to buy:-

1 902 type Cathode Ray Tube, in good order. Write - C. Serle, Box 2600 Melbourne.

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VICTORIAN DIVISION**

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Meeting Night—First Tuesday in each month.

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Treasurer: W. McELREA, VK2UV
Councillors: V. BENNETT, VK2VA; N. GOUGH,
VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

**DO YOU WANT TO BE
BACK ON THE AIR?**



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DIVISIONAL ADDRESSES:

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NEW SOUTH WALES:

BOX 1734JJ, G.P.O. SYDNEY.

VICTORIA:

BOX 2611W, G.P.O., MELBOURNE.

QUEENSLAND:

BOX 1524V, G.P.O., BRISBANE

SOUTH AUSTRALIA:

BOX 284D, G.P.O., ADELAIDE.

WESTERN AUSTRALIA:

BOX N.1002, G.P.O., PERTH.

TASMANIA:

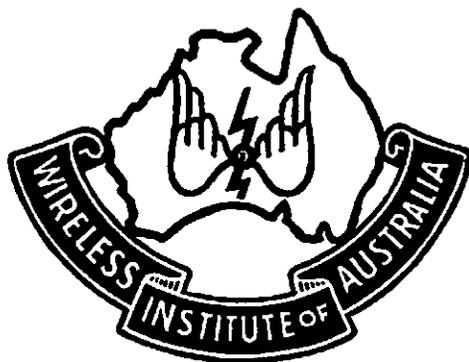
BOX 547E, G.P.O., HOBART.

SIXPENCE

AUGUST 1942

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. 10, No. 8.

August, 1942.

AUSTRALIAN EXPERIMENTERS RECOGNISED.

AMATEURS AND THEIR EQUIPMENT GIVEN A PLACE IN CIVILIAN DEFENCE.

Since the ban on Experimental transmissions came into force shortly before the outbreak of war, Federal Headquarters and the various Divisions individually have submitted various schemes at different times to the Postmaster General's Department for the use of the Services of those Licenced Experimenters and their gear in the present emergency. The Department has favorably commented upon one or two of these schemes, but unfortunately the Naval Board--the body controlling communications in wartime, could not see its way clear to grant permission for the breaking of the seals.

Several Divisions were far from discouraged by constant rebuffs, particularly New South Wales. With the entry of Japan into the war, considerable impetus was given to Civilian Defence organisations in this State, namely the State War Effort Co-Ordination Committee and the National Emergency Services. A scheme of Radio Communication embracing the services of Amateurs and their equipment was placed before the former body, but at first received scant consideration. Shortly afterwards a State Wide Emergency Test was held, and ordinary means of communication did not function as well as was expected. With this knowledge, the Institute again placed its suggestion before the State War Effort-Co-Ordination Committee and this time it was favorably considered, and it was decided that the Postmaster-General's Department be again approached.

After several months of protracted negotiations, Amateurs throughout Australia will be pleased to learn that the Wireless Institute of Australia and Australian Amateurs generally are the first in the world to be recognised by a National Government and allotted a place in the defence of their Country. On the 8th July 1942 permission was received from the Department of the Navy for the operation of the Emergency Communication Network!

Briefly the operation of the Network will be as follows:-
The Wireless Institute of Australia, New South Wales Division will work in conjunction with the State War Effort Co-Ordination Committee and will provide operators and equipment 25 stations.

These will be located in Sydney and outlying suburbs and frequencies have been allotted in the 28 mc band. In addition the Institute is to supply and train operators for a medium frequency commercial installation. Thus the whole Radio Communication installation of the State War Effort Co-Ordination Committee will be manned entirely by hams. After many years of untiring effort the Wireless Institute of Australia has at last convincingly demonstrated the value of the Experimenter to the community.

Applications from Experimenters interested are now being received by this Division and very soon the Network should be in operation.

-----ooOoo-----

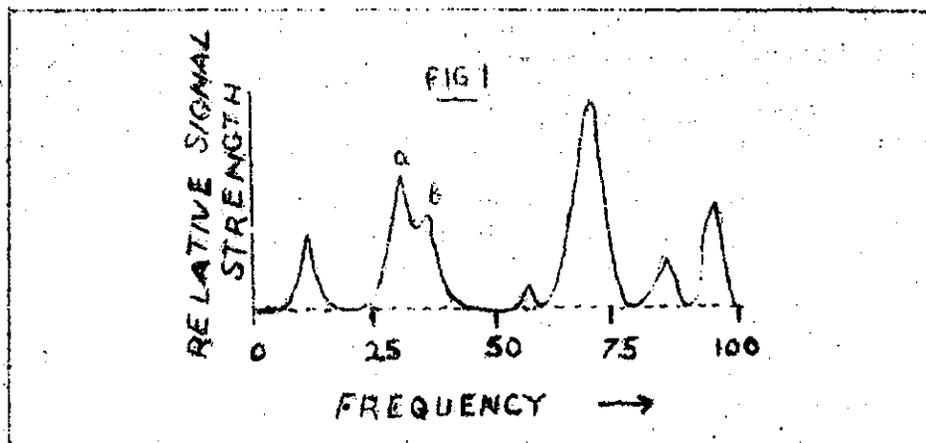
THE PANORAMIC RADIO SPECTROSCOPE

-- Extracts from Q.S.T. March 1942 --

WHAT IT DOES - The Spectroscope is attached to any communications receiver for displaying a band of frequencies on the screen of a cathode-ray tube, where each signal appears as a separate peak, showing its frequency, strength, type of modulation, fading characteristics and frequency stability, as well as the nature of any interference.

Panoramic reception can be easily understood by reference to Fig. 1. Suppose we have an ordinary receiver and tune it through a band of 100 kilocycles, starting from any frequency desired, say 3900 kc. If we should plot the strength of the signals as we pass them against frequency, the curve might resemble that shown, each peak representing a received station. The width of the signal will depend upon its strength and the selectivity of i.f. amplifier, and what we actually do is plot a series of i.f. resonance curves as we pass through the various signals. Peaks a and c are too close in frequency for complete separation; in other words, the signals are so close that the i.f. selectivity is not sufficient to make them appear as isolated peaks.

In the panoramic receiver, a similar curve is traced by the oscilloscope spot each time the receiver is tuned through the band, and by repeating the tuning rapidly (25 times per second or more) the trace appears as a continuous line.



The station to which the receiver is tuned appears in the centre of the screen, while stations above this frequency appear on the right half of the screen and stations of lower frequency on the left half. The band-width represented by the graduated horizontal scale can be varied from 0. to 100 kc or more. The stronger the signal, the higher its "peak", so that relative strengths can be seen at a glance.

If the operator tunes the receiver slowly, stations move in a procession across the screen, so that a visual picture of the whole band is quickly presented. Each station in turn passes over the mid-frequency mark on the horizontal scale as the receiver tunes through it and it is heard.

HOW IT WORKS: Circuit details are not yet available, but a commercial version of the radio spectroscope connects by an input cable clipped on to the plate prong of the receiver mixer or converter tube. Detuning of the receiver i.f. is prevented by an isolating resistor at the clip. The i.f. signals are carried through the cable to the panoramic scope and are then amplified and passed through a second mixer where they are converted to a new (second i.f.) frequency, then through a sharply tuned second i.f. amplifier, a final detector and an audio amplifier, to the vertical plates of the cathode-ray tube. A compensated band-pass amplifier delivers a "flat-topped" band to the second converter so that the actual strength of a signal is represented fairly accurately by its height on the screen.

The second converter is "swept", i.e., the frequency of its oscillator section is varied periodically through a range of frequencies by means of a reactance tube. A saw-tooth generator feeds the reactance tube and also feeds (through an amplifier) the horizontal plates of the cathode-ray tube. Thus at any instant the second mixer with its second i.f. selects a single frequency and delivers it to the cathode-ray screen as a vertical deflection. But the frequency selected is varied periodically from one end of

the band to the other, simultaneously with the horizontal deflection of the cathode-ray tube. The result is that the whole band of 100 k.cs (say) is portrayed on the full width of the calibrated screen, with the signal to which the receiver is tuned appearing in the centre.

The sweep frequency should be at least 25 per second to eliminate flicker, but should not greatly exceed this for a selective receiver as otherwise the signals will not develop full vertical deflections.

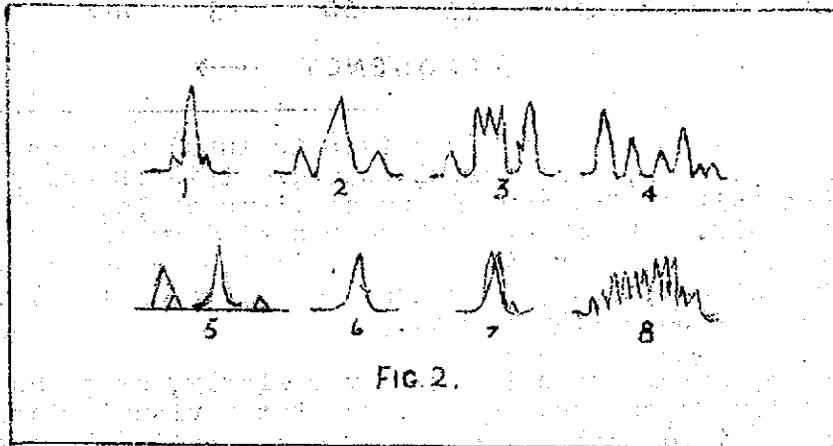


FIG. 2.

Fig. 2, showing tracings of some photographs of the Cathode-ray screen,

1. Carrier modulated with 3,000 cycles, sweep-width 70 k.c. Note sidebands.
2. Same as 1, sweep width reduced to 25 kc.
3. 14 mc. amateur phone band.
4. Portion of the broadcast band. Stations every 10 kc.
5. Three automatic telegraph stations. Trace closed at bottom indicates keyed signal. On the left side a key click appears.
6. Frequency modulated carrier during period of silence.
7. Same with very little modulation.
8. Same with heavy modulation.

If the band width be cut to zero the cathode-ray tube acts as a normal oscilloscope showing the modulation envelope of the signal tuned in on the receiver.

POSSIBLE USES. Just a few applications should appeal to hams. One can instantly see the loudest station on the band or the one most free from interference; those DX stations like WQ8AH who used to wander about 50 kc. during an over can be followed with ease; a transmitter can be steered into a clear spot; key clicks, over-modulation or frequency instability are shown visually; that elusive multiplier can be watched, literally, during a contest; and think of the pleasure of going over after a CQ-DX and seeing the DX popping up all over the band!

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WATCH YOUR CHASSIS' CONNECTIONS FOR SAFETY

Here is a safety kink taken from QST which seems to have received little prior attention in spite of its obvious importance. It concerns power supplies where the power section is made as a separate unit.

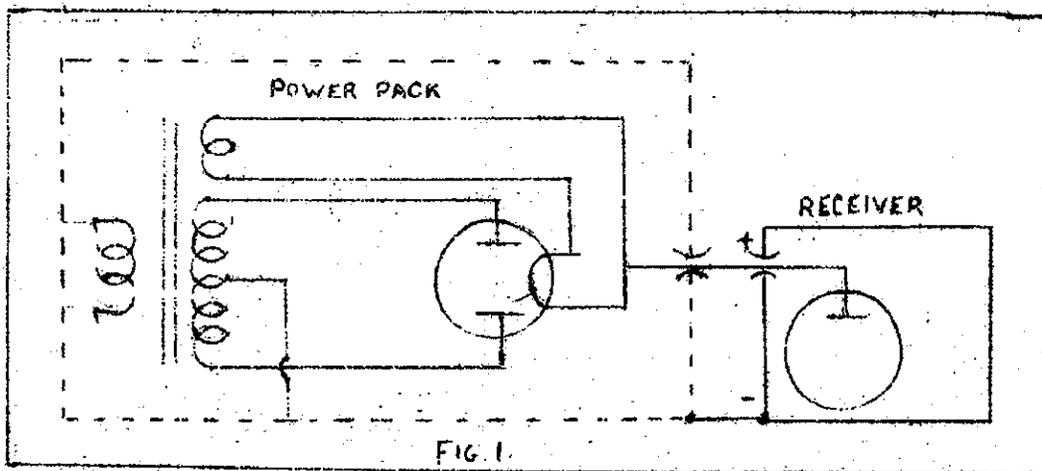


Fig. 1 shows that if the negative of the power supply is grounded to its own chassis and a negative return wire is connected between the two chassis, a highly dangerous situation can exist. If, accidentally or otherwise, the negative return wire is broken or removed, the full high voltage appears between the two chassis. It is very easy to overlook the fact that the chassis may at any moment carry high voltage, whereas if the B- is carried to the receiver by a separate wire as in Fig 2 all high potentials are confined to the leads which if broken or disconnected would be recognised as potential dangers anyway. Of course an unsound connection of this kind is likely to be made only by the inexperienced, to whom this article is mainly addressed. Never under any circumstances should the B- be connected direct to the power supply chassis. The golden rule for the B- should be "First stop--receiver Chassis."

If it is desired to have a E- run to an external ground this must be effected through the receiver frame, back via a ground wire and through the power supply chassis to ground, as in Fig. 2. Connected in this manner, no shock can result from a disconnected load.

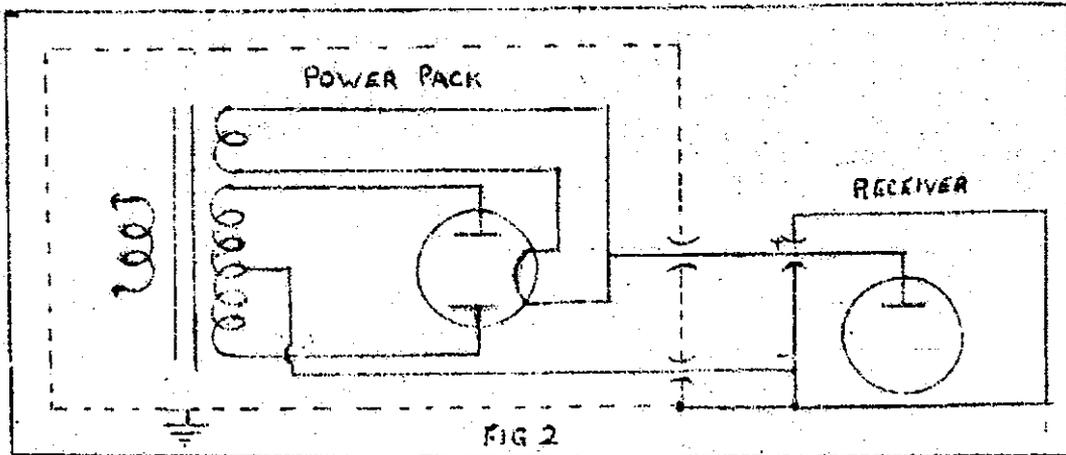
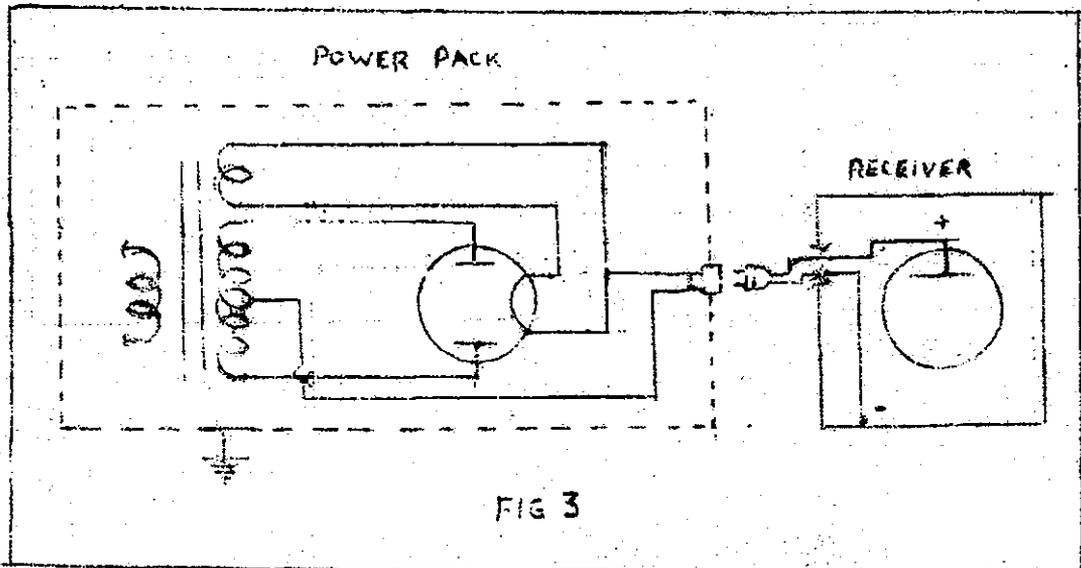


Fig. 3 shows one sound solution of the problem, since pulling out the plug used renders the power supply quite harmless. Ordinary house fittings are quite suitable electrically up to voltages of about 500 and maybe higher,



WHISTLING METEORS

Some interesting work has been carried out by the Research Department of All India Radio on a phenomenon which, as far as it is known, has not previously been reported. A short account of the work is given in the "Wireless World" and it is from this that these notes are taken.

It was noticed that when listening to the un-modulated carrier waves of the Delhi short wave transmitter at a location only 10 miles distant and therefore well within the skip distance for the sky wave, there were frequently audible heterodyne whistles of a peculiar type. These usually appeared as a high note of perhaps 3000 cycles frequency which rapidly descended in pitch, finally disappearing from one-fifth to several seconds after first being heard. They are likened to the 'ping' made by a rifle bullet deflected from a rock.

From this description it is easy to recognise the phenomenon and it is probable that most radio men have heard it at one time or another without realising its special significance.

Ordinary heterodyne whistles are usually of a roughly constant pitch, or at any rate do not vary in frequency in this characteristic manner. It was realised by the A.I.R. engineers that these whistles must be due to interference between the directly received ground wave and a wave being reflected from a rapidly moving surface. Such a wave would suffer an apparent change in frequency, or Doppler effect and it is this which, beating with the directly received ground wave, produces the heterodyne note. The descending pitch of the note is due to the moving reflecting surface being retarded in velocity down to zero.

The only likely phenomenon with a sufficiently high velocity to produce such Doppler effect is that of the meteors or "shooting stars" which enter the atmosphere, and the fact that these were indeed responsible for the whistles was confirmed by observations of the appearance of meteors in the sky; their appearance coinciding with the whistles heard in the receiver.

The meteors apparently expend the greater part of their kinetic energy in ionising the molecules of atmosphere gas the ionisation being caused by the energy of the impact of the molecule with the high speed meteor. Such ionisation can be sufficient to reflect radio waves of the frequency concerned, more particularly from the region of the head of the meteor.

By observing the initial frequency of the whistle it was possible to calculate the velocity of the meteor, and experiments showed that this, was sometimes in the region of 60 km per second, which agrees well with the figure obtained from visual observations. This and other experiments indicate that the whistle phenomenon will be of value in obtaining information on the conditions obtaining in the upper atmosphere.

----cGo----

A NEW WORD ?

You might think that "radio-phone" or indeed the use of the prefix "radio" in connection with voice communication at a distance and without connecting wires was something that dated back no great number of years. As a matter of fact the term "radio-phone" was first used so long ago that even the oldest of us must have been infants at the time.

The name was applied round about 1880 to a system of telephony developed by the famous Dr. Graham Bell, the Scotsman whose name will live for ever in the annals of the telephone and the gramophone. In 1878 Bell was still trying to find a completely satisfactory means of impressing the modulation corresponding to sound waves upon an electric current. It was suggested to him that the selenium cell might be used for the purpose, and he developed an apparatus which used it and worked.

Sound waves from the lips of the speaker were made to impinge upon a small and very light mirror, free to move. A ray of light focused on to the mirror was normally reflected on to a selenium cell. When words were spoken into the instrument the mirror was set in motion, and the reflected light varied according to the received sounds. Though it evoked much interest when exhibited in America, Bell's radio-phone never succeeded in doing anything better than effect the barely intelligible reproduction of the simplest speech sounds.

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U.S. Bans New Sets.

The U.S. War Production Board has ordered that the manufacture of broadcast receivers and gramophones for civilian use must be discontinued after April 22nd of this year.

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SLOUCH HATS AND FORAGE CAPS

Wally Ryan, 2TI, tells me I have now to somehow or other fill two pages each month. That first means the end of my little surplus that I sometimes keep over. Secondly, will my usual correspondents please double themselves...thank you...and ever so many thanks to those who have unfailingly helped me so far.

What do you know...you remember how I "stuck up for" 3RJ, in my column last month? Well, I take it all back...that reporter of mine certainly knew a thing or two, for a week or so ago, Ray...Pilot Officer Jones, I mean, of course, wandered into 2YC's, and with a sardonic gleam in his eye said, "I'm returning to VIS on Thursday, Jim." When you think they nearly had the range...as I said before, wouldn't it...I'll never get that QSL position, so send him back, Vaughan.

Another laddie making frantic efforts to get out of VIS, since "our raid" is F/O Frank Goyen 2UX. After being on a ferry during the sub. attack, he says he "pines" for Alice Springs. But his yf who is at MES Control Centre tells him not to worry as she will give him a special "rod." They both "blitzed me then when I innocently asked if the pay-office cash was to be counted. One can never trust families....I find.

Fl/Serge Bill Lewis 2YB/6YB was down in VIS sponding his seven day's Home Leave. He is up at where, as Bill puts it, "a few of our chaps are "minding" a whole lot of Yanks."

From Mr. Roberts Snr. we have news of 2JV. He was in a Singapore Hospital ten days before the surrender. A shell splinter caused a nasty flesh wound in his arm. As he was in the 8th Division Signals over there, he should have some stories for us later on. Meantime, we can only wish him...best of luck om. Incidentally, Mr. Roberts Snr. has the "real Ham spirit" as he forwarded along his son's subscription for 1942-43.

Gnr. Morehead is taking a signalling course with the 1st Motor Div. Sig. School...he wishes he could get a transfer to this unit since their signallers seem to "get plenty of signalling" Hi!

VE2CI arrived safely back from "across the Timor" and was surprised to find the Institute still going OK...oh, Gordon, with Wally as Federal Secretary, and me with a column...Gordon says that at one time in Darwin he was the proud "possessor" (pro-tom) of six motor cars and two trucks. Hi! He reckons that real dinky-die shrapnel doesn't sound at all like it does at the Talkies. A couple of skinned forearms from dodging it in a hurry are proof enough. The revr and Xmitter in the Zeros

are wonderful pieces of work he says, so once more the Japs aren't as Dumb as we were led to believe. However, I believe, that J is off his QSO list after the War, on account of their accuracy in bombing some beautiful word-carvings he had gone to a lot of trouble getting safely back to Darwin from the East. 2CI said it felt worse than blowing ones best and last tube.

Morrie Myers seems to have become a Flight Loot... good work, om. Up in..... where he is they have the "usual" Ham Gathering. 3ML and then next to Bob for variety is W3HZU.... Major Rocky, a wellknown W call. W9RE is also on the Communications Staff, and last to come is VK2ZE who received his Commission the same time as Johnny Trill 2XQ. Morrie says that Super Pros, NC100X, HROs and Super Skyriders are "two a penny" up there. Why, ohwhy, was I ever a Stay-at-home Chemist????

Another chap up North now, is Cec Horne 2AIK who seems to have safely dodged the NSW Education Dept., which was trying to get him back to work. Glad you beat them to it, Cec.

Back from up North...very far north...is VK5FA, who is looking forward to bombfree months at Canberra, along with 4RF, the Ws and 2EO's Chooks.

4RF, our Correspondent...and what a newshound he is...there'll be a political upheaval at 2YC if he gets shifted. He also reports the 3RY's been so industrious up there stringing antennas at Navy's V/T Station that the whole place now resembles a gigantic cobweb.

Canberra is also reported "lousey" with Hammarlunds, HROs, etc., but alas, for 2ACG, 2EO, 4RF and the rest of the gang, not a single one has been written off yet. Hi!

Con of 2LZ still rusticates out at Parkes...I think he is a Fl/Sarge these days. Why don't you get into the Hush Hush Service, Con? Some of those experiments of yours should come in useful.

and here is where I will leave it this month, with a nice little nest egg from 2NO stowed away for next month... just in case. Now, remember chaps, this is OUR new and better WARTIME Amateur Radio...and this is YOUR column. So send along all your news to 2YC...78 Muloney St., Mascot, N.S.W. or ring MULO92, and you will never recognise what you tell me. Hi!

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

.. Federal Headquarters ..

The main subject of discussion at the July Meeting of the Federal Executive was success attained by the New South Wales Division in their efforts to provide an Emergency Communications Network for the State War Effort Co-Ordination Committee. It was decided that each Division be informed of the procedure adopted by New South Wales, so that eventually the Network would become Australian wide.

The news that Victoria and New South Wales had agreed to amalgamate their respective publications was received with pleasure and it was decided to go ahead with the scheme to take care of the interests of Amateurs in those Divisions where the Institute was comparatively inactive.

CC DX

AMERICA - We hear stories of Radio hams in many fascinating and unusual jobs these days, but unfortunately their tales will have to wait until the war is won and the lid lifted of many things that are very "hush hush". Here is one interesting job that we can talk about.

The call W6GRL owned by Doc Stuart was well-known throughout the world in the "good old days", both in Dx Contests - fone or cw and he was always fond of a rag chew. W6 GRL's work these days is to receive and transcribe the daily English voice broadcasts emanating from XGoy and XGOX, Chinese international broadcasting stations in Chungking.

The programs are recorded on instantaneous acetate discs and are then transcribed. W6GRL is aided in this work by a private Secretary-probably the only one in the world who takes dictation from a source 7000 miles away through static, heterodynes, fading and hush.

The receiving antenna used by Doc is interesting. It is a diamond type, highly directive, with a mile of wire in the system.

The A.R.R.L. Board of Directors held its first wartime meeting during May and President George Bailey and Vice President Charles Blalock were elected unopposed. Many matters affecting the American Ham and the A.R.R.L. were discussed at length both trifling and important. One particular item of interest to hams both in and outside U.S.A. was a proposal to move the 20 metre fon e band to the low frequency end was defeated.

ENGLAND. Time marches on. April issue of the T. & R. Bulletin states that due to the severity of paper rationing, the size of that magazine is to be reduced. One very popular section due for the axe is "M.O.T.A." - "The Month Off the Air". This page, originally commenced by Ham Whyte in the days when Dx was Dx and not ten miles from the main transmitter, then known as The Month on the Air, was always interesting reading. With the sudden demise of ham radio in England, it continued to chronicle the doings of countries that were still transmitting on the amateur wavebands. Now with the course of events there is really nothing to chronicle.

Incidentally, at its February Meeting the R.S.G.B. approved of 147 applications for membership.

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NEW SOUTH WALES DIVISION

The July Monthly Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 23rd., having been postponed from the previous week on account of the blackout.

The news that the Division's scheme for a National Emergency Communication Network had been received with the blessings of the powers that be was received with enthusiasm by all present, and the main part of the evening was given over to discussing this matter. The Institute is grateful to Lieutenant Walton for the very valuable advice tendered regarding semi-portable equipment and the availability of materials.

A Technical Committee comprising R. Priddie VK2RA, P. Dickson VK2AFB, V. Bennett VK2VA, W. J. McElree VK2UV and F. G. Ryan VK2TE has been formed and they are at present working on details for standard circuits for Transmitters and Receivers, Antenna Systems and operating procedure.

Members were pleased to learn that a basis for amalgamation satisfactory to both "A.R." and the Bulletin had been reached and were looking forward to the August issue of the Magazine.

Supper Jim Haining VK2AKZ on sick leave from an "Advanced Allied Battle Station" gave details of Japanese bombing attacks on an Australian town in the North. It was unfortunate that Roger Torrington VK2TEJ was not present. At a later date an endeavor will be made to match these two lads over one hundred yards on the flat in an endeavor to create a world's record for that distance with a view to Olympic honors.

It was unfortunate that Popoyo was unable to give his long awaited description of the Jap subs that were sunk in Sydney Harbour. It has been rumored that he has "acquired" one for a souvenir.

The next General Meeting of the Division will be held on Thursday 20th August 1942 at Y.M.C.A. Buildings commencing at 8.00 p.m. and it is anticipated that quite a lot more information will be available regarding the Emergency Network.

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VICTORIAN DIVISION

There was a good attendance at the annual general meeting of the Victorian Division which was held at the Rooms on Tuesday night August 4th.

The president, in his address, touched on the various activities of the Division during the last twelve months. These activities, though limited, consisted mainly on the production of the magazine and the Morse classes conducted with the view of providing instruction for those who wished to gain proficiency in code, prior to joining some arm of the services. The classes had proved a huge success and had filled a gap for those who lacked themselves of the experienced instructors, instructors who gave their services willingly without thought of gain.

In the election of President three members were nominated - viz:- Mr. J. G. Marsland, 3NY; H. N. Stevens, 3JO; and I. Morgan, 3DH. The ballot resulted in Mr. Stevens being re-elected by a large majority.

The Council elected were:-

I. Morgan,	3DH	G. Quin	3WQ
T.D. Hogan	3HX	J.G. Marsland	3NY
R. Marriott	3SI	H.N. Stevens,	3JO
K. Ridgeway		B. Burdekin	

Vice-Presidents were:- Messrs. I. Morgan, 3DH; K Ridgeway and T. D. Hogan, 3HX.

A visitor from VK2 in the person of Roger Torrington VK2TJ was present. He is to be located in VIM for some time.

At the next meeting service conditions permitting, George Bonwell VK3KQ, a member of the Navy will give a lecture, the subject being, "Radio Direction Finding."

It is with deep regret that we announce that Sgnt Pilot Jack Burrage has been posted missing and must be assumed dead. Jack, 3UW was second engineer at 3SR when he joined the R.A.A.F. He was piloting a heavy bomber and when last seen he was heading towards Java in a heavy storm.

3WG..is reported to be somewhere in the north of Australia.

3YK..after his adventures in Malaya etc., adventured into marriage on his return, now Gavin is adventuring somewhere in the north of Australia.

3RJ..was present at the annual meeting. Ray looks fit and well. He did say something about Women, presumably he was referring to the W.A.A.F.

3EF..is now a member of the R.A.A.F. but seems to be having a bad time as he spent a little time in hospital although it wasn't very serious.

3HG..now sports a crown above his three stripes.

3OW..and his YF are to be congratulated on the arrival of a son.

3UM..and his YF are also to be congratulated as they also have a son.

3ZK.. was last heard of in Brisbane, maybe he's a long way further by this time.

3BN..is now in sole charge of the farm. Bruce was married recently.

3UR..a member of the R.A.A.F. 3KV..is also an R.A.A.F. man.

3KQ..is in the Navy as is 3MV

3DH..should have no fear when he needs first aid...Mrs. Morgan headed the list at a recent examination.

POSTED MISSING:-

Lt. A. G. Weynton VK3XU

Captain J. Tutton VK3ZC

.....

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VICTORIAN DIVISION**

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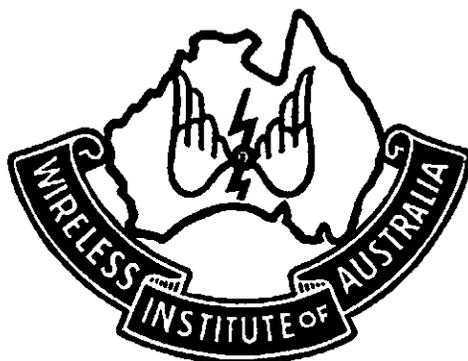
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SIXPENCE

SEPTEMBER 1942

AMATEUR RADIO

THE
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OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



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HOMODYNE RECEPTION

Details of a little known method of reception are given in an article published in a recent issue of the "Wireless World." The following particulars of this new and interesting system are taken from the above mentioned article.

The "homodyne" system of reception is a little known member of the family of radio "dynes", so let us first see how it is related to its cousins heterodyne, super-(sonic) heterodyne and audodyne. The word 'dyne' is derived from the Greek for power, so that heterodyne merely means putting in energy at a different frequency, and becomes "supersonic-heterodyne" if the frequency difference is greater than audible, while audodyne means putting in its own power, i.e. a self-oscillating detector. Similarly, homodyne means that energy is put in at the same frequency, i.e. in synchronism with the carrier of the signal which it is desired to receive, and this is the homodyne system which may be able to help us with the selectivity problem.

Interference may be divided into two categories, the type which involves the carrier of the wanted signal, and the type which does not. In the first category we have the direct heterodyne between the wanted carrier and a neighboring carrier, "side-band splash" which consists of heterodynes between the wanted carrier and the side-bands of the interfering signal, and cross modulation; in all of these the output of interference is merely proportional to the weaker of the two frequencies which are beating together so that increasing the strength of the wanted carrier makes no difference to the interference. Before we can benefit from the homodyne principle therefore, adjacent carriers must be spaced far enough apart for the heterodyne note to be outside the audio frequency band, or alternatively the heterodyne must be eliminated by means of a "whistle filter" of some sort.

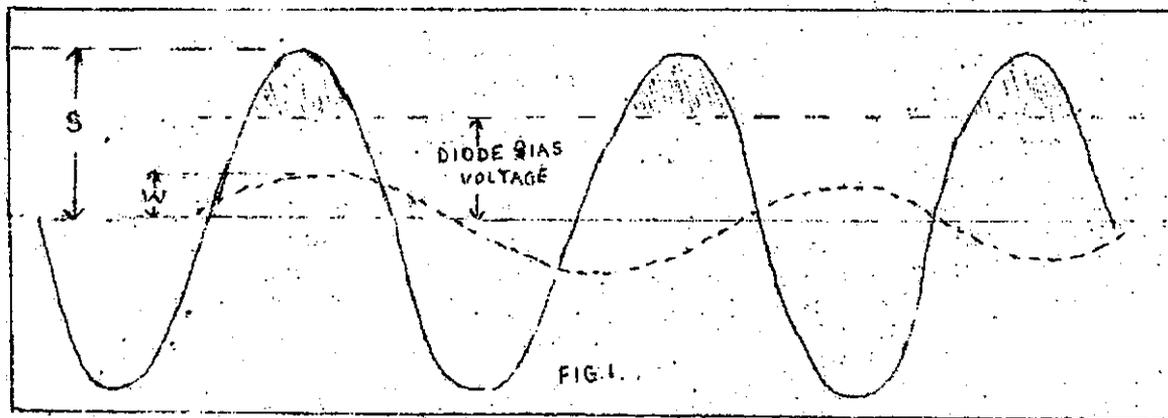
It seems likely to take a very long time to produce sufficient public demand for high-fidelity broadcasting on the medium wave band to secure the sacrifice of a number of stations to

adequate spacing of channels; in fact it is a debatable point whether the introduction of wide-band U.H.F. broadcasting would render superfluous high fidelity in the medium-wave transmissions, or whether the experience of really good quality would lead to a demand for it on all transmissions. Assuming, however, that we have by some means eliminated the adjacent channel cross-modulation, the residual interference will consist of the whole modulated signal (carrier plus side bands) of a transmitter on a neighboring frequency.

SELECTIVITY LIMITATIONS

There is an essential distinction between the wanted and unwanted signals, by reason of the fact that they have different carrier frequencies and so it may be possible to eliminate the interference which consists solely of the independent signal more effectively than heterodyne etc. which involve the carrier of the desired signal. But first one must answer the natural question, why not rely on selective circuits? A satisfactory receiver would need adjacent channel selectivity of 10,000; 1. If anyone can design such a receiver we need not worry about homodyne receivers.

The phenomenon underlying homodyne reception actually occurs to some extent in every receiver using a linear rectifier, that is to say almost every modern receiver when a reasonably strong signal is tuned in; it is that a linear rectifier is most sensitive to signals in the same phase as the strongest signal out of several applied to it. In the ordinary diode rectifier, the diode is automatically biased back by the signal so that it is only conducting for a small part of the cycle, say the extreme positive values of the voltage wave as shown in Fig 1.



If now the amplitude of the signal is varied by modulation there will be a change in the height of the voltage peaks, therefore an increase or decrease of diode conduction, and this in turn will change the bias voltage so that conduction occupies

the same proportion of the whole cycle as it did for the original amplitude. But the bias voltage on the diode is in fact the rectified output, so that variations of this voltage with the input represents an output signal proportional to the amplitude modulation of the input signal.

DETECTOR DISCRIMINATION

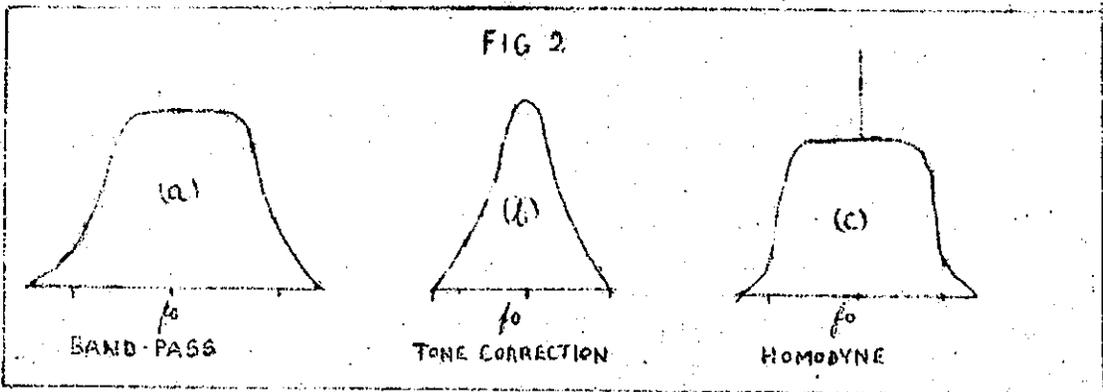
Now suppose there is added to the input a smaller signal, at a different frequency, as suggested by the dotted curve in Fig 1. The first positive peak of this second signal falls fairly well on the conduction period (determined mainly by the strong signal) and therefore increases the rectified current; but the second positive peak falls in a non-conducting period and therefore cannot affect the output, while the second conduction period is accompanied by a negative peak of the smaller signal, which reduces the rectified output and so tends to oppose the effect produced in the first conduction period. It is obvious that the weaker signal has relatively little effect if of different frequency from the stronger one, since it is the latter which decides when the diode is conducting; as often as not the weaker signal comes up positive when the diode is thoroughly cut off by the stronger signal, and on these occasions when the diode is conducting, the weaker signal is as likely to be negative as positive. This is only a very rough picture of the action, but when it has been properly worked out mathematically, the ratio of the AF outputs due to modulation on the strong signal S and on the weak signal W is approximately $2 S^2/W^2$, and the phenomenon is known as rectifier discrimination. To see how useful this is, suppose that by means of selective circuits we have made the wanted station supply a carrier voltage 10 times greater than of the unwanted station at the input to the detector; this represents a signal interference ratio of 20 db, which would not be very good. But if $S/W = 10$, the ratio of the audio frequency output voltages is $2 S^2/W^2 = 200$ or 46 db which is tolerably satisfactory.

SELECTIVITY AND TONE CORRECTION

In earlier receivers this gain from linear detection was not always obtained, because the signal level at the detector was so small that the detector did not function as an off/on device, as described in connection with Fig 1, but as an approximately square-law device which conducted rather better in one direction than the other; since the stronger signal was thus not sufficient to stop conduction for part of the cycle, the weaker signal could always produce some effect, regardless of its phase relation to the stronger signal, and no rectifier discrimination was obtained. One of the first specialised systems to obtain this advantage was the 'tone correction' type of receiver. The RF circuits were made of maximum Q , so that a very high gain was obtained at carrier frequency and low modulation frequencies, though the

higher side-bands were relatively cut by a very large amount and after detection the severe top cut was corrected by AF tone correction circuits. Owing to the strong carrier, this gave good 'rectifier discrimination,' but the top boost in the AF circuits exaggerated any harmonics produced in the process of rectification and the popularity of this system was short lived. In fact it died a natural death with the development of the super-hetrodyne and AVC; the latter required a large enough amplitude at the detector to ensure linear rectification, while the former provided the means of getting sufficient gain, and at the same time made it technically possible to use selective band-pass circuits with a square topped response, giving good adjacent channel selectivity without requiring tone correction.

But good tuned circuits are expensive and critical in adjustment, and of recent years the number of high powered transmitters has been greatly increased, so that once again selectivity is a problem. The tone correction system was on the right track; but the top boost in the AF circuits was an intolerable nuisance; the solution then appears to be to increase the application of the carrier only, while retaining a uniform amplification for all the side bands from lowest to highest, and this is the homodyne system. The three systems are represented diagrammatically in Fig 2. Diagram (a) normal receiver with square topped response curve; (b) sharp circuits requiring subsequent tone correction, and (c) homodyne receiver with carrier only accentuated.



If wanted and unwanted signal reach the detector with equal amplitudes, the result will be a hopeless jam; but if we can add to the desired signal an artificial carrier of just over 30 times the existing carrier strength of either, we immediately obtain a rectifier discrimination of $2 \cdot S^2/W^2$ equivalent to 66 db and reception is perfect without any disturbance of the

audio frequency response characteristic. In fact the audio frequency performance is improved, because an incidental advantage of the homodyne system is the elimination of one source of distortion in the detector. With a normal diode detector feeding a load circuit whose AC impedance is less than its DC resistance, distortion occurs when the depth of modulation exceeds some value such as 75% (depending upon the ratio of AC to DC load); but when the carrier has been artificially increased for homodyne reception, the depth of modulation will always be small, so that the ratio of AC to DC detector loads is no longer critical.

ARTIFICIAL CARRIER

The problem of course, is how to produce this artificial carrier, which must be exactly in phase with the original carrier of the wanted signal, and there are two main lines of attack. According to one method the carrier is selected from the input by some form of filter, and amplified more than the side bands. There are various methods of inserting the filter in the circuit and a method of selective negative feedback has been suggested as suitable; but this does not go far towards solving the problem, for the filter still has to have a very narrow response, even if it is connected in the negative feedback line instead of in a straightforward coupling between two stages of amplification. It can be assumed that the receiver is a super-het and probably the IF will be 465 kc, while the lowest audio frequency can be put at 50 cycles. (Any rise in the response to frequencies below 50 cycles can be easily offset by a falling off in the characteristics of loud speaker and AF amplifier.) The carrier selecting filter must therefore have a band width of not more than plus or minus 50 c/s in 465 Kcs, which is a fairly difficult proposition even for a crystal filter. In addition the intermediate frequency must then be correct to something like 20 c/s, which means that both the accuracy of tuning and the stability of the local oscillator must be as good as 20 parts in a million for the higher frequency end of the medium wave band, and proportionately better for short wave working.

The other line of attack is to use a local oscillator somewhat similar to the IF beat oscillator used for CW reception, to generate the extra carrier voltage, and synchronise this oscillator with the signal carrier. Probably most experimenters have done this at some time or another with a receiver using a reacting detector; if the reaction control is smooth enough, reception free from beat note can be obtained although the set is gently oscillating. But this is not really a fair example of homodyne reception since it involves also a great increase of Q of the tuned circuit, and hence loss of high audio frequencies, which would not be present with a separate oscillator. In any case this is hardly a method of reception to let loose on the

general public. But granted the use of a super-hot circuit and a separate oscillator valve for generating the carrier which is then a practically constant frequency there are possibilities in the way of designing the oscillator specially so as to hold synchronism over as wide a range of frequency as possible, though even so, tuning would need to be exceptionally accurate, and oscillator drift small. One of the troubles is that on 100% modulation the carrier of the signal to be received falls to zero, and the homodyne oscillator would then be almost certain to drop out of synchronism. Another snag is that the artificial carrier from the local oscillator would predominate in the output from the detector, so the DC component could not be used for AVC, which would have to be derived from independent IF circuit free from carrier injection.

POSSIBILITIES OF DEVELOPMENT.

It is clear that a good deal of development would have to be done before a commercial broadcast receiver could be built on the homodyne principle. However, looking at the transformation of the radio receiver during the last 10 years or so and the parallel transformation of the television receiver from a 30 hole scanning disc in front of a neon lamp into the cathode ray type of receiver, it does not seem unduly optimistic to say that the difficulties inherent in the homodyne system of reception could be overcome in a commercial design.

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ELECTRIC SOLDERING IRONS.

In wireless work where most fluid fluxes are banned on account of their corrosive properties, special kinds of soldering paste are used. Generally speaking, if a soldering iron becomes overheated to such an extent that the tinning is burnt off, it becomes necessary to file the copper bit heavily before it can be re-tinned. The life of the iron is thus greatly reduced and metal is wasted. This waste can be avoided by adopting the following method.

With the hot iron first melt half a dozen pellets of solder on to a flat iron plate. Then take an old rough file and dip the end of it into the flux and rub the file tip over one surface of the bit. The heat of the iron causes the flux to flow over the cleaned part. Next pick up a pellet of solder from the iron plate by striking it smartly with the cleaned surface. Give another light rub with the flux coated file, and a clean, bright tinned surface will result. Repeat for the other surfaces of the bit.

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WIRELESS IN THE LUFTWAFFE

Some months ago we published a general description of some of the radio gear used by the Luftwaffe. This information was taken from the Wireless World. Further details of this equipment have been published in the same journal, and we are passing on this extra information for the benefit of those who do not have access to the journal named.

One of the most interesting and unconventional features of the equipment was the iron cored direction finding loop. It is mounted externally to the 'skin' of the plane and a flexible drive coupled to a handle on the compass repeater rotates it through a worm gear in the base. The shaft runs on ball bearings, and a 360 degree scale is attached to the main gear wheel for checking agreement with the scale on the repeater compass.

The aerial coil former is made of bakelised fabric $\frac{1}{4}$ inch thick and 13 inches long. It is of oval section measuring 3 inches on the vertical and 4 in. on the horizontal axis. The windings consist of 8 turns of litz wire approx. 0.08 in. in diameter, wound symmetrically on each side of the former and connected in parallel to give an inductance of 3.2 μ H. Inside the former the iron dust core is built up of ring sections placed coaxially. The core material has been taken out and measured, and its permeability is of the order of 60.

Connection to the receiver is made through a screened twin cable with a characteristic impedance of about 30 ohms. The cable is half an inch in diameter and is divided in the centre by insulating material. Each half is occupied by a semicircular conductor of tinned copper braid.

D.F. LOOP PERFORMANCE... The performance of the loop antenna has been checked, and it is found to give a polar diagram of normal type. For purposes of comparison a second loop aerial was constructed without an iron core, and the turns adjusted to give an inductance equal to that of the original. The energy pick-up of the two loops was measured by interchanging, and the iron cored loop gave an increase of 10 db over its air cored equivalent. The iron core greatly increases the weight and the loop is actually 3 lbs heavier than the DF receiver itself.

The superhot circuit used in the receivers comprises 8 valves starting with a stage of RF amplification, followed by a separate oscillator with injection to the grid circuit of the mixer valve. There are two IF stages, the output of which is rectified by an anode bend detector and then passed to the AF output stage. A BFO is adjusted to beat at 1000 cps with the intermediate frequency. Fo AVC is used. All RF coils have

closed iron dust cores and the inductance is adjustable by means of a threaded end section. Fixed ceramic condensers are used to tune the IF circuits and a combination of positive and negative temperature coefficient ceramic condensers are used in the oscillator circuit associated with the frequency changer.

MECHANICAL CONSTRUCTION .. Screening between stages is very efficient and accounts for the high overall gain obtained. The chassis is of the die-cast construction and the compartments are arranged round the four sides of a central three-ganged condenser. The fixed plates are earthed and the rotors, which are mounted in a ceramic spindle, are live. Location of the tuning condenser for operation on 'spot' frequencies is effected by means of discs mounted behind the dial. Each disc has a notch which engages a projection on a spring loaded lever. The common spindle for the four levers is mounted eccentrically and provided with a knob. Thus all four spot frequencies can be varied simultaneously over a small range. Four locking screws passing through the main knob permit independent adjustment of the setting of each disc, and a mechanical indicator system shows which spot frequency is in use.

Everything about the receiver, and indeed about the equipment as a whole, is very heavy and expensive and gives the impression of being designed by a radio engineer with a ground station outlook rather than one who has specialised in aircraft design. The equipment is however designed as a complete installation, and the units fit together to occupy very little space with short interconnecting cables. The latter are easily replaceable when shot away, and the units themselves are simple to dismantle and reassemble for servicing.

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SILENT KEYS

It is with regret that we chronicle the passing of;

Leonard P. Nyland VK7LP who passes away on the Third of July 1942 after a short illness. Len who was only thirty years of age, contracted a chill whilst at his post during a big A R P demonstration in Tasmania late in June.

Herbert T. Brimsdon VK2BX who died at the Royal Prince Alfred Hospital, Sydney after a short illness. Bert, as he was known to many amateurs throughout Australia, was one of the pioneers in this country on ten metres. Despite bad health during later years he always maintained a keen interest in the Institute and Amateur Radio generally.

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SLOUGH HATS AND FORAGE CAPS

Life is full of disappointments for all War Correspondents - of that fact I am assured. Just listen to this tale of woe.

Wilf - 2ALF - you may know was on the H.M.A.S. Canberra, just the place to turn himself into frontline news. Now I ask you, does he, being a wireless op., leave the ship at the very last moment, swimming through shark infested waters, etc. etc. reaching safety and spending weeks and weeks surrounded by V.A.D.'s etc. Not he - he's modern. I see his photo in a paper, as wounded and think - what copy! But alas he is no help at all. The wounded rang me up the same day and then following - amongst other conversation resulted. Says 2 YC - I thought you were in hospital. Of no, only a bit of shrapnel in my thigh, been there 12 days, its no trouble - may not even bother getting it out. And so away goes half my news, so I hopefully try again. How about the sinking, Wilf - 'did you have any fun - have to swim far. Swim, why I just climbed down the side on to the deck of a destroyer - but I've a nice Yank giggle suit - and that's all he had to say.

Now, I ask you, how can I write adventure stories about hams I like this?

Anyhow, I got Jones, 3 RJ, back to VIS. I must now see if I can raise a J.

2AFN - Tom Slawson. Tom is yet another ham of whom the news is "Missing in Malaya." His brother also in the sigs has been posted officially missing, but so far Tom's name has not appeared.

X2BX - Bill Smith is now W.O. in the RAAF and has just been posted to an advanced station. Judging by how well he looked when seen in VIS the RAAF life "sure suits him."

2AMS - now a P/O and swapping over from a W/Op. to an observers job. Had a nice stay in Sydney but now believed "far away."

2ACJ - finished his training in Canada - now a P/O. News of him is in a message sent home which says "Finished first job and got back safely." ACJ acts as navigator, so he's the chap who got them "there and back." So keep it up O.M. Believe he stopped a VE's car while in Canada. VE 4 turned out to be a very well known dx bird who had a gala day with VK's during a contest.

2AMQ - back in Sydney for keeps from Darwin - looking for a bit of peace and "quiet." Never struck any W hams up there. AMQ was in the Engineers - said they built roads and roads and various types of houses.

2ALG - news is - he "copped" a small piece of shrapnel in the leg. Nothing serious we hear. Hope it didn't mean the loss of that lovely ginger beard I've heard so much about. O.M.

And now 2NO very kindly fills up the rest of the column - what a correspondent.

(2NO - (Capt. Don B. Knock) Sigs. A.M.F.) recently found himself in VK3 at short notice, doing a refresher course before tackling the tough (?) job of teaching Army YL's to be efficient sig. women. Looking around the W/T class he found that he had unexpectedly welcome company in the form of Al Joscelyne (VK2AJ0) and Les Taylor (VK2GL) both Corporals on the same tough (?) job!! The opening lecture of the course was delivered by a L/Co. who turned out to be VK3DC! During the instructional period VK2NO was shown over a communication centre in VK3 and has not yet quite recovered from the shock of revelling in what is virtually a ham's dream. Miles of rhombic arrays soak up the R.F. amps from QRO Tx's that are keyed by UHF channels instead of lines from the control centre. Rx's such as SX28's grace tables and the store shelves carry vast stocks of 813's, 810's, 100TLs, ampere HF tubes and the latest R.C.A. UHF types. Every type of RX tube imaginable is also on hand in quantity. High light of the array of gear was a complete FM station of W manufacture. The C.O. and 2/lc of the outfit are both prominent VK 3Is - hence the powerful ham flavor to everything. The VK2's who put in the period in VK3 don't think much of Vic's WX in winter though. They all developed a choice brand of flu - and 2NO landed in a Military Hospital most of the time with something akin to pneumonia. Nevertheless, Don reckons he knows just where he will be looking for government surplus radio gear in the days when the big stouch is over.

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

.. FEDERAL HEADQUARTERS. ..

The usual monthly meeting of the Federal Executive was held at Y.M.C.A. Buildings on Thursday 20th August. The Secretary informed the Meeting that details of the Emergency Communication Network, that is to operate in New South Wales, were informed on to all States. In addition another appeal was made to the various Divisions to provide material for "Amateur Radio" with a view of making the magazine more of an Australian publication than it is at present.

The possibilities of a W.I.A. Prisoners of War Fund was discussed, and it was decided to circularise the States with the object of obtaining their views and if favorable get the Fund under way as soon as possible.

THE EMERGENCY COMMUNICATION NETWORK

Considerable progress has been made with the preliminary organisation of the above Network. Nearly one hundred and fifty applications for enrolment were received by the Technical and unfortunately, at this juncture, all offers to assist could not be availed of; nevertheless, the men whose services cannot be used for the present have been placed on the Reserve of Officers. Letters of appreciation of the work done by the Institute continue to pour in from all quarters, particularly from those chaps on Service and many offers of the use of equipment are gratefully acknowledged.

For the time being the operations of the Network will be confined to Sydney and Suburbs, but eventually it is anticipated that every large town will have its installation until such time as the Network becomes State wide. Just how long this will take is difficult to say. The State War-Effort Co-Ordination Committee state where a station is to be installed, and it depends entirely on that body just how soon the scheme expands.

The original intention of the Technical Committee, who by the way consists of R.A. Priddle VK2RA, A.V. Bennett VK2VA, P. Dickson VK2AFB. W.G. Ryan VK2TI and W. McElrea VK2UV, was to make use of existing equipment in order to get the Network in operation quickly, and then eventually substitute this equipment for a standardised station. It was found however that nearly every Member who would have to re-build so it was decided that each station would be equipped with standard tx, rx and power supplies from the inception. The transmitter will consist of 4 stages crystal controlled, using an 807 in P.A. cathode modulated. The receiver will be a super regen. with a stage of R.F. and there will be two power supplies one of which will be independent of the A.C. mains.

At the present time the members of the Technical Committee are visiting the various localities where stations are to be installed and meeting the Amateurs who are interested and putting before them full details of the scheme and obtaining details of the gear that will have to be released from seal.

Those applicants whose services are accepted will be investigated by Security Service, and if satisfactory will be enrolled as Members of State Co-Ordination, attested, issued with Police Passes, Arm Bands and where necessary stickers for the windscreen of cars, and a Certificate to be issued by the Institute, stating that they are Members of the Emergency Communication Network.

A word of warning. Do not touch any seals until such time as you receive permission from the P.M.G. to do so and do not make any direct applications to the Senior Radio Inspector. The Institute will take care of all applications and they will go through in toto.

Once permission has been received to build R.F. equipment and units are completed, exercises will be held each week until such time as proficiency is gained in procedure and the quick handling of messages. These exercises will be made realistic and will be part of State Co-Ordination trials that are held from time to time.

NEW SOUTH WALES DIVISION

The August General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 20th August.

In declaring the Meeting open, the chairman extended a welcome to several new Members who had joined up in appreciation of the work done by the Division in obtaining permission to form the Emergency Communication Network. In all twenty five applicants were admitted to Membership.

The chairman gave a resume of the progress made in putting the Emergency Communication Network into operation. The response to date has been excellent, the number of applications for enrolment far exceeding the Technical Committee's expectations. One very pleasing feature was the response from Members on Service and others who could not operate who offered the use of their gear.

Members were informed of Federal Headquarters' suggestion that a Prisoners of War Fund should be established in order to provide funds for those Amateurs unfortunate to be made captive. This division favored the suggestion, but were of the opinion that a central fund should be established and administered by Federal Headquarters. Each Division should endeavor to raise funds and forward them on to F.H.Q. together with a list of amateurs, not necessarily members of the Institute, who were known to be Prisoners of War, and that it would be the duty of F.H.Q. to see that they were kept supplied with comforts.

An appeal for Technical Articles for "A.R." was made to members present and this also goes for you chaps that weren't. As you know August issue of the magazine incorporated the Monthly Bulletin and comprised fourteen pages. VK2 has given an undertaking to provide at least nine of these pages and YOU can help by writing an article of interest to Amateurs generally, or should you not feel capable of this, why not send that letter that you received from that ham

on Service along to 2YC for inclusion in "Slouch Hats and Forage Caps". Remember chaps that the magazine is an all in effort and it must not be left to one or two chaps to keep it going.

With reference to the loss of H.M.A.S. Canberra, members will be pleased to learn that all the radio men were saved. Other than Wilf Harris VK2ALF it is not known whether there were any other hams on board. Wilf, I understand, is at present carrying a piece of shrapnel around with him as a memento.

Regarding the loss of the Sunderland flying boat carrying the Duke of Kent, Flight Lieutenant F. M. Goyen is not the same F.M. Goyen VK2UX who, prior to joining the R.A.A.F. and receiving his commission, was Chairman of the New South Wales Division of the Institute. Due to the similarity in names both christian and surname, several members have rang the Institute making enquiries, but Members are assured that Frank is still hale and hearty, making the boys smile each payday.

Amateurs will be pleased to learn that Arthur Henry VK2ZK was recently promoted to the rank of Major. Arthur left Australia many months ago and served through Egypt, Libya, Greece and Syria, and earned his promotion through sheer merit, passing through the hardest school - Active Service - with honor. Members of the Special W/T Section speak highly of 2ZK's work as a technician.

The next meeting of the Division will be held at Y.M.C.A. Buildings, Pitt Street, Sydney on Thursday 17th September, commencing at 8 p.m.

VICTORIAN DIVISION.

The usual monthly mee ting of the Victorian Division was held in the VIA Rooms on Tuesday September 1st. Unfortunately George Benwell 3KQ who was to have delivered a lecture was unable to be present. George is in the Navy and was drafted a few days prior to the meeting.

However, the members present found sufficient to keep them occupied in the discussion on the new Security Regulations requiring certain transmitting apparatus to be taken into official custody for the duration of the war. Many varied opinions were expressed - the meeting being unanimous as to the value, as a Security measure, of the sealing of certain equipment when transmitters could be constructed with the greatest of ease from receiving components.

After a long discussion it was decided that the Secretary should write to the Senior Radio Inspector and request that experimenters be given the opportunity to re-pack their gear as, at the time of sealing, no mention was made of the fact that

it should be in a transportable condition. Members present were not happy at the thoughts of what would certainly happen when power transformers started bouncing about in a box with loose transmitting tubes. The question of insurance was also brought up and it was decided that the Department be requested to indemnify the owners against loss or damage whilst the gear was in custody.

Federal Headquarters were also to be notified of the action taken by this Division.

A letter was received from the Federal Secretary concerning the establishment of a Prisoners of War Fund to cover the cost of parcels sent to Hams known to be prisoners of War, members and non-members alike. It was decided that a collection be taken at each meeting and also that Council be asked to consider the matter of a regular contribution. The sum of ten shillings was collected at the meeting. Members not able to attend meetings may forward contributions to the Treasurer if they so desire.

The next meeting of the Victorian Division will be held on Tuesday October 6th, in the Institute's Rooms.

Members are reminded that Amateur Radio will not be forwarded to unfinancial members after this issue.

Ken Allen 3UH is back in VK on leave. His ship was sunk in the "Musso's Little Pond."

3WG..we learn departed for the near north complete with Tin hat and other sundry equipment. Best of luck Bill.

3FR..Sergt. Fred Smith, sorry Staff-Sergt, is with a sigs station in VK6. Fred also got married recently.

3GY..Clem Day on receiving his military call-up transferred to the R.A.A.F. as a wireless mechanic.

3HF..Harold Fuller is now an engineer at 3YB Warrnambool.

3YL..loves the Army and the Air Force..just ask her. She's been keeping a record on the map at the WIA Rooms.

3YK..has been promoted to Flying Officer.

3XH..S. W. Johnson is a Lieut Colonel with L.H.Q.

-----000000-----
REPACKING OF GEAR

Amateurs desiring to re-pack their gear should ring Mr. Pearson, Central 5551, exten. 26. Suitable arrangements can be made with Mr Pearson.

-----000000-----

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OF AUSTRALIA
VICTORIAN DIVISION**

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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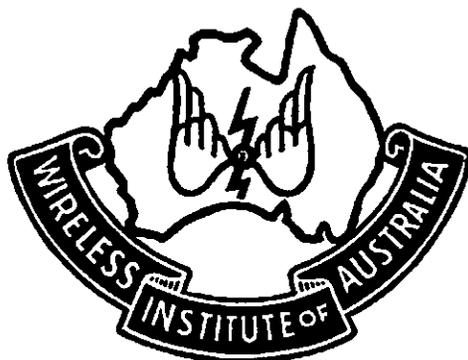
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SIXPENCE

OCTOBER 1942

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THE
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OF
AUSTRALIA



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October, 1942

REMOTE CONTROLLED PRE - AMPLIFIER.

.. By Chas. Quin, VK3WQ ..

They say that Necessity is the Mother of Invention - well here is an example.

PLACE. A hams home with a 57-2A5 B.C.L. in the kitchen, joined, per medium of Antenna, to the shack, about $\frac{1}{2}$ wave length distant. Here a 6D6 6C6, 76, 42. T.R.F. is used as a Short Wave Set, or in this case, a preamplifier. A mike switched into the Detector circuit providing the necessary audio pickup.

TIME. During meals, or while the YF is washing up, and OM is reading the daily paper with his feet up on the gas stove.

NECESSITY. Junior op in the front bedroom (adjoining the shack), transmitting to the world in general that he is awake. To be certain of this, and not wanting to put his paper down, the OM thought and thought ----- RESULT.

INVENTION ?????? See diagram 1. - but don't be disheartened - its quite simple to operate - all you have to do is get somebody to press the button.

OPERATION OF THE UNIT IS THEN AS FOLLOWS:-

B.C.L. of course is in operation and YF is listening to her favorite serial. Strange sounds come from the front of the house - those sounds NOT associated to DX and certainly not CQ. Button pressed is number 1 - this places 250 volts between Antenna and ground. Relays 1, 2 and 3 operate and hold in. No. 1 holds in because its winding has the same resistance as the bias resistor of the 2A5, and Nos. 2 and 3 hold in by means of the local battery at the shack.

No. 1 at the BCL switches Antenna or line from tuning coil to Grid of 2 A5, through a condenser - this to isolate any high voltage from the grid - it also switches Cathode of 2A5 from normal resistor to the Relay winding, and then current of 2A5 holds this relay in.

Nos. 2 and 3 at the shack operate as follows - No. 2 switches local battery, also AC to power supply to TRF, No.3 switches local battery also, and when AC comes on, one Pilot Lamp.

This is the first half of the operations and BCL is still in normal operation with the exception that the grid of the 2A5 is switched to line.

When rectifier of TRF power supply has warmed up, current flows through choke, Voltage divider and Relay 4's windings. This Relay operates and holds in, performing the following switching actions. Antenna or line is switched to grid of 4Z through a condenser, at the same time opening the battery return for Relays 2 and 3 - these then drop out of circuit. AC is still switched to power supply by the remaining contacts on Relay 4. The second Pilot Lamp now lights through 3's contacts. TRF is then in normal operation with the exception that the grid of the 4Z is switched to line.

Return circuit for Relay 1 is taken through Antenna coil of BCL to prevent any likelihood of "cross-talk" from broadcast stations.

RELEASE. To release the TRF from the BCL end, Button 1 is pressed again and held in for a few seconds to enable the apparatus at the shack to become disconnected as follows:-

250 volts is again applied between line and ground - this operates Relay 5 at shack, which places an Earth on Relay 6. Then relay 6, being in parallel with Relay 4, operates, and then 4 and 5 drop out of circuit - this because No. 4's earth return is opened by No. 6's contacts, and No. 5's line side is opened by No. 4 dropping out of the circuit.

Relay 6 is hold for so long as Button 1 is pressed, thus preventing 2 and 3 making contact and thus repeating the primary cycle of operations. Increased load of Relay 6 on BCL power Supply reduces EMF and likewise Current of 2A5, therefore Relay 1 releases and BCL is then in normal operation. When Button 1 is released Relay 6 drops out of circuit and Relay 1 resumes its normal position.

REMARKS. Current taken is not excessive. For first pressure of button the current is only 25-30 Milliamps - this because the Relays operate immediately. For the Second pressure of the Button the Current is higher - 60 Milliamps - this because 1000 ohms is across line and ground. An 83 Rectifier is used at the BCL as this has higher current handling facilities than the 80.

Old type Telephone Relays were used, - these were of fairly low resistance (1000 ohms) and their contacts were only a pair of DPDT. With the exception of Relay switch which has a resistance of 6000 ohms. This is not a telephone type relay, but was taken from a Fultograph Machine.

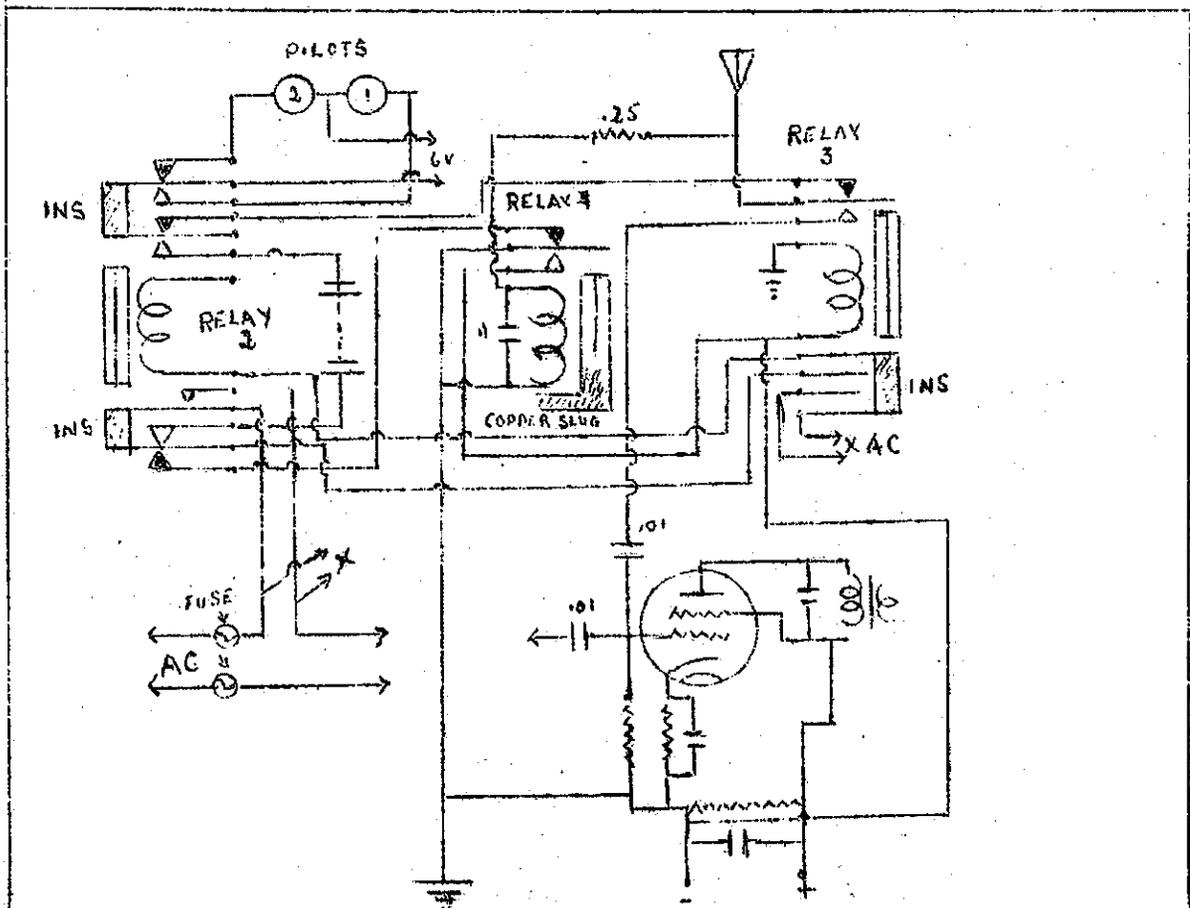
With higher resistance Relays and a different arrangement of contacts, this unit could be constructed to operate with fewer Relays. For example, one would still have to be used at the BCL end; and at the shack, one to operate and hold until the rectifier supplied current to operate a further relay, then a third to switch this off and still remain in circuit until all apparatus had been disconnected.

See diagram 2 for a suggested circuit .

The TRF also has an Antenna of its own, and this could be utilised to receive any Special programs the OM may want to listen to during Meals (with of course kind permission of the KP), when the Junior op is having his tea.

This unit has been in operation for over four months now, and the writer can vouch for its ability to operate as soon as tubes warm up, which is only a few seconds. It has a few advantages over other pre-amplifiers the writer has seen in the past, in that it does not consume current while not in the operating condition. Usually tubes were used and the unit just switched in when required.

Complete absence of hum is another feature. Even tried with a higher level hum was still conspicuous by its absence. If construction of this unit is contemplated, be very careful of insulation of all loads and connections before trial operation as 230 volts AC and 250 Volts DC are in close proximity. Use good quality condensers to isolate grids of audio tubes from line. Also Antenna connections should be good and well insulated from earth.



NOTE. Copper slug will retard action of Relay 4 for sufficient period so that Relay 2 will operate before Relay 4 breaks its circuit when first switched on.

THE ELECTRON MICROSCOPE.

... By W.J. McElrea VK2UV ...

Much of our present day knowledge would still be unknown if Science had not had that most important instrument, the microscope, to investigate details too small for the unaided eye to see and to discover minute organisms and fine structure in substances which had been quite unsuspected prior to its invention.

By the term microscope we mean an instrument by which we obtain an image of small objects and so any optical arrangement, even a single simple lens, which will give an enlarged image, whether real or virtual, of a small object, may be regarded as a microscope.

The term microscope, however, is usually applied to the compound microscope, which has a lens system consisting of an objective and an eyepiece, while a third lens called the condenser may be used to illuminate the object. In the modern optical microscope the useful magnification may extend to 3000 diameters, the limit being imposed by the wavelength of the light used for illumination, as we shall see later.

In the compound microscope the objective is the most important lens since its properties make or mar the final image to a much greater degree than do those of the eyepiece. Incidentally, although we refer to the objective as a lens, an objective of even medium power is invariably composed of two or more lenses, the number may go to six or even higher.

The main functions of an objective are -

1. To gather the light coming from any point of the object.
2. To unite this light into a point at the image.
3. To form the image at such a distance that magnification is obtained.

To examine the finer details of structure it is necessary that the light utilised shall come from the object examined in as wide a range of directions as possible, the Numerical Aperture (N.A.) of the lens depending on this angle and on the refractive index of the medium in which the object is immersed.

Now it may be thought that there is no limit to the amount of magnification of detail that can be obtained in a microscope, but unfortunately, after a certain degree in magnification is reached, further increase in magnification does not increase the amount of detail visible in the image and "empty" magnification which does not bring out additional minute structure is of little aid in the study of any object.

This loss of detail is due to diffraction taking place when light travels through the object - an image of a very fine slit, for example, would not appear as a slit but as a series of light and dark bands - and the greater the wavelength of the light and more objectionable is the effect of this diffraction.

Using an immersion objective with a N.A. of 1.52 (the maximum possible) the limit of resolving power in microns (1 micron = 10^{-4} cm) is 0.17 and thus the smallest object which can be resolved by the optical microscope in violet light is 0.17 microns in thickness.

A thinner line would not be shown as such but would still appear 0.17 microns thick. This distance is about one half of the wavelength of violet light (0.4 microns). For photographic work the limit of resolution in ultraviolet light is about 0.15 microns.

The optical ultramicroscope will reveal particles smaller than this in the same way that a beam of sunlight illuminates dust particles floating in a darkened room but the image seen does not necessarily duplicate the structure of the object.

Thus we can see that no matter what improvements are made in lenses no direct optical observation in visible light can clearly show any objects less than 0.17 microns in thickness.

The Electron Microscope. We have seen that the limitations of the optical microscope are due to the wavelength of the light used and not to inefficiency of modern lenses and hence microscopes have been developed which depend on electron streams and not upon light. Practically all of the theorems and corrections of geometric optics have been translated into their equivalents in electron optics and by means of magnetic and electric fields lenses have been calculated which will give the electron equivalent of an optical instrument such as the microscope.

According to de Broglie the wavelength associated with an electron having a speed corresponding to V volts is $\frac{12.27}{\sqrt{V}}$ Angstrom units; thus the wavelength corresponding to an electron speed of 50,000 volts is 0.55×10^{-3} microns and so, taking the N.A. of the largest diameter magnetic coil which will produce a satisfactory image as 0.02 the resolution of the electron microscope can theoretically be 0.27×10^{-3} microns at 50,000 volts and 0.19×10^{-3} microns at 100,000 volts, thus giving a resolving power nearly 1000 times as fine as the optical microscope.

Every amateur who has used a cathode ray oscillograph knows that in it we have a stream of electrons produced by an "electron gun" which is caused to vary in direction by means of electric or magnetic fields. This stream of electrons strikes a fluorescent coating on the screen of the tube and then, and only then, shows its existence to us by causing this fluorescent coating to emit visible light.

Now in the cathode ray oscillograph we are interested in examining the voltages which are causing the deflection of the beam and for this observation the stream has to be focussed so that it meets the fluorescent coating in as small a spot as possible. This is achieved by varying the potentials of the anodes in the electron gun portion of the tube.

In the electron microscope we have a similar state of affairs in that a stream of electrons emitted from or passing through a given

object is passed through "electron lenses" in such a manner that when the stream meets the fluorescent coating at the base of the microscope all the electrons emitted from or passing through a given point in the object are caused to meet again at a point, thus giving an image of the object.

The focal lengths of the electron lenses of course are so chosen that this image is larger, and sometimes enormously larger, than the original.

Now the electron microscope at present is used in two ways -

1. To produce an image of the density of radiation of electrons from heated surfaces - i.e. various types of cathodes and alloys at elevated temperatures. A simple microscope, when used at powers of from 10 to 100 diameters is very useful to metallurgists, radio engineers and physicists in studying intimate details of electron emission.

2. For examination of fine detail in substances where the optical microscope has insufficient definition. Recent electron microscopes produce an image magnified about 30,000 diameters with such good definition that the definition is still good when enlarged by photographic means to 100,000 diameters. The main disadvantages of the electron microscope at present are -

1. The currents in each electron lens have to be very accurately controlled if blurred images are to be avoided.

2. The immense magnification makes the utmost rigidity necessary in the instrument and in the building housing it.

3. The instrument has to be compensated to account for the effect of the earth's magnetic field which will cause a considerable deflection of the beam.

4. Specimens under examination must be introduced into a high vacuum of the order of 10^{-5} mm. and there exposed to the electron beam. The high vacuum and electrical or thermal effects produced by the electrons may alter the specimen before or during examination.

Applications:-

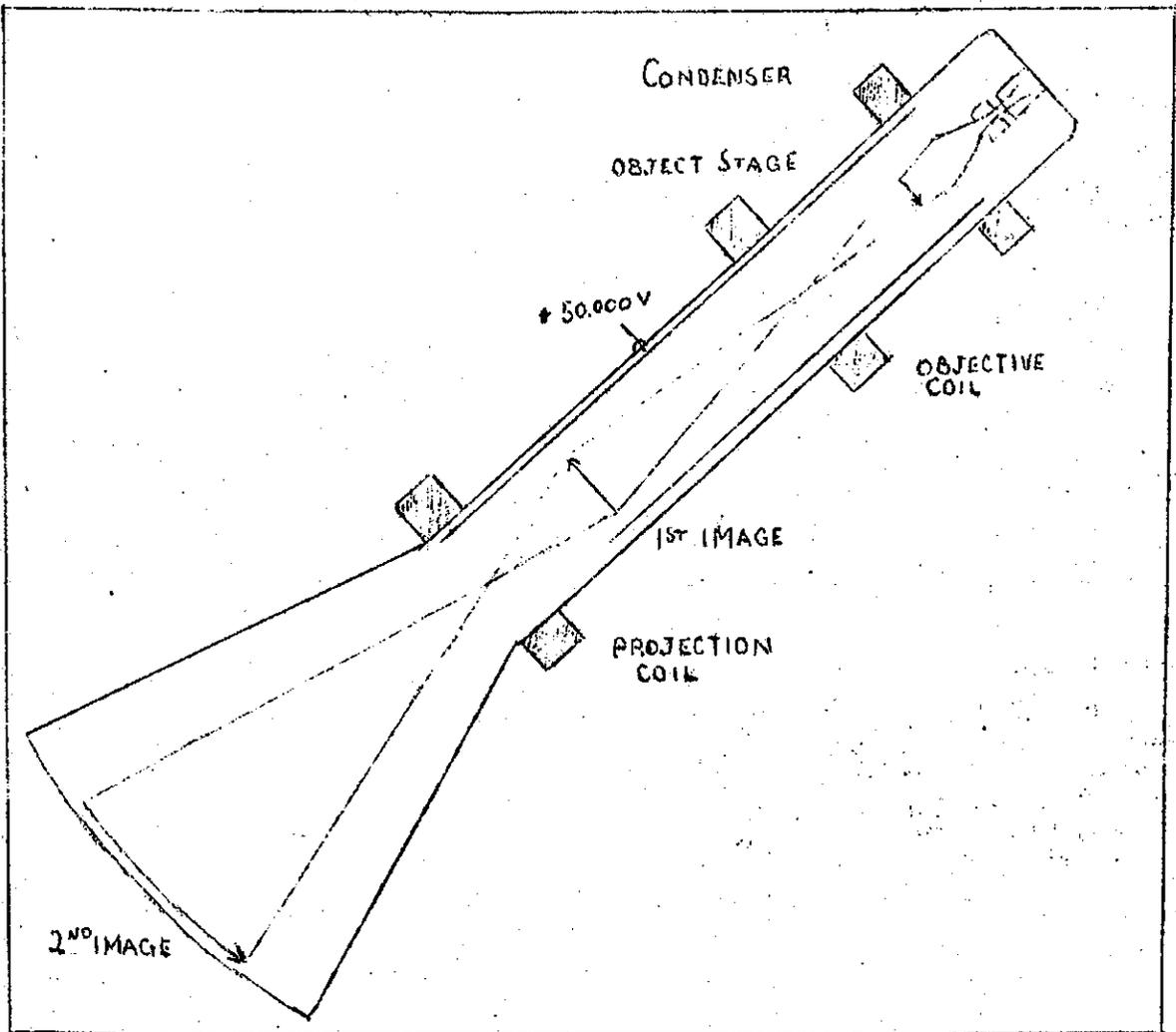
A recent edition of the "News Edition" of the American Chemical Society states: "Photographs made in preliminary tests show what are presumed to be individual giant molecules, the shapes and sizes of colloidal particles, and intimate details of certain types of bacteria, which the weaker power of optical microscopes could not reveal. Photographs of anthrax bacilli, germs of pneumonia, and typhoid bacteria show these to possess strangely intricate structures. These micro-organisms apparently are not the simple bits of jelly-like substance seen by customary light microscopes. The new instrument is expected to uncover new and important facts about the action of catalysts, which mysteriously promote chemical action; the action of chemicals on the bacteria of disease, since it may be possible to see how the drug actually kills the germ and the nature of synthetic resins and the processes by which they are formed."

Conclusion.

The electron microscope has now been developed far beyond the stage of a mere scientific experiment and can now be considered as a very important instrument for research. It represents a means of obtaining information which has previously been entirely beyond the means of direct observation.

Experiments are still being continued and it is hoped to eventually approach the ultimate resolving power of which the electron microscope is capable.

Reference . "Electron Optics" by L.M. Myers is a comprehensive work on the subject of electron lenses etc. and much of the material in this article was obtained from it. Any man wishing to learn some of the fundamental theory of electron lenses should consult this work - provided he is no more than a lap behind Einstein - the author of this article was left at the starting post.



SLOUGH HATS AND FORAGE CAPS.

... By VK2EC ...

Dear Oms,

You will never know what you missed. I'd had the old pen soaking in various kinds of vitriol in the dispensary - and I wasn't going to write about lack of notes, but along comes SIR and the gang chock full of news, and all is forgiven. As I can't do better here's SIR "verbatim."

" Ken Allen VK3UH recently returned from the Mcd. got himself sunk in the Nestor, anyway Ken got off OK and it is whispered that many meters did not go down with the ship--hush! Ken says a bomb got tangled up with their di-pole and fell down the side of a ship. Anyway giving him a rest here and he has just bought a brand new P&C handbook to fool the RI's into believing he knows enough to accept the 2nd Class Commercial. By the way everyone here has gone all commercial nowadays. 3KQ (now up the tropics) and myself (SIR) both sat for the commercial ticket some months ago, neither of us has finished celebrating yet - strangely we both passed - most amazing!

Jack Coulter VK3MV - one of the Darwin boys, hasn't been home long. One of our receivers wanted re-lining tother day, so Jack brought down his box of tricks - a piece of apparatus which gained for him the name of "The Meanest man in Radio." Boy you should see it, its an oscillator come freq. meter, come sig generator, come Xtal set, come Monitor etc. It does everything but talk. Ask Jack what happened on his birthday - true he got amongst the hops and when he met his and 3KQ's XYL's he kissed the wrong one - must have been Sydney beer.

Talking of 3KQ (George Bonwell) he got a crash draft a few weeks ago to I thought I saw him running up and down the parade ground with his kit over his port shoulder practicing evacuation! If he can't work J dx via the ether he says he will get amongst it personally. Perhaps he may throw a few KW at them.

An amazing man called Stan Clarke-Troy of the Sir Kieth Murdoch Broadcasting network is an engineer of some repute in broadcasting circles and he devised a jar with two plates and a gallon of oil as a substitute for a condenser which departed this life here last night. Everyone is scared to go near it, primarily because it may blow up and secondly because if we move it an inch or so every marine operator is screaming at our frequency drift.

As for me, well I've been a bit ill lately - come call it a perpetual hangover, but the medical profession assert it is nerves.

Anyway had a good six weeks spell in hospital doing nil but am now back at the key again and soon be moving away for a bit. Was talking to VK5GP tother day - Graham Pitts by name - he is in the Marine Staff of AWA and is chief op on the lighthouse ship. Also saw Norm Gunter VK3NG also of AWA who continues to crawl around the coast as of yore -- 73 Harry White VK3IR."

From 2 ABM off the HMAS Cairns comes more news. He mentions meeting VK6FL and VK6AG and a couple of W's of the USN whose call signs he could not remember (what a man). He mentions a VK6 (Ted Potter) and a VK2 Jack Lumsdaine of the N.S.W. Police Force as being on the H.M.A.S. Toowoomba. However, the way chaps move around these days he says they may be anywhere at all by now.

Here in Sydney at the last WIA meeting we had quite a gathering, L/Tel Clark - who spins a pretty good yarn, W6PIZ off the Chicago and two very welcome VK3's, 3TE (Stan Dixon) and 30J (Stevens) who came in after attending lectures. Its really great to find chaps keen enough as hams - even after three years off the air - to find time after a lecture to look in at a WIA meeting in a strange city. By now they have probably moved on with their units, but we hope they make Sydney again soon. From our regular visitor VK3RJ we learned that Dud Britt 3HT and Bert Zander 3PG both with the Arm Divvy were well and fit and should be sampling pineapples off the bush by now. 3RJ also mentioned meeting Ron Hipwell and Gavin Douglas both of the R.A.A.F. in the harbour city, recently.

From Cpl. Sabin, R.A.A.F. Darwin comes news also of the ham spirit. Before the war he was a member of the Manly Radio Club and was sent up to N/W Australia. Meeting there a chap from VK5 by name of Bob Fuller - they did some fag and at the local post-office sat and passed for the "ticket" so no time would be lost when it was time to call CQ again. Don't you reckon these two will make good hams--congratulations OMs - very FB indeed.

News comes to hand that Charlie Miller VK2ADE/4US is back in VK2 at last after nearly 3 years over the other side with the Sunderlands. Next month I hope to tell you more of what he and his cobbles have done over there. But consider their operational flying hours -- Norm McLeod 2PM 1700 hours, 2ADE 1200 hours, Frank Doherty 3XE 1100. And don't forget the operations were NOT flying up and down VK!

73 and more news chaps for next month to VK2YC, 78 Maloney Street, Eastlakes, N.S.W.

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

.. Federal Headquarters ..

...

Despite the fact that the September Meeting of the Federal Executive marked the third anniversary of the ban on transmissions by Experimentors the volume of business transacted was unduly large.

The main topic of discussion was the action of the Chief Radio Inspector, acting under instructions from Security Service, in directing that wireless transmitting apparatus belonging to amateurs should be taken into official custody for the duration of the war. Immediately Federal Headquarters were informed of this order a lettergram was sent to the Chief Radio Inspector asking for an extension of time for the lodgement of containers belonging to amateurs who were not satisfied that the components were securely packed. In addition assistance was asked for in the case of those Experimentors whose gear was packed in bulky containers. All requests made to the Department by F.H.Q. were granted by the Chief Radio Inspector.

Some little time ago Federal Headquarters asked the Department for a ruling regarding that clause of the Australian Broadcasting Act that stipulated that an additional fee of ten shillings was to be paid for every receiver after the first in any persons possession. The majority of Experimentors have built up quite a number of receivers of various types for operation in various parts of the spectrum allotted to amateurs and F.H.Q. were of the opinion that some injustices would be caused if amateur receivers were to be placed in this category. A reply has been received from the Department which in the opinion of F.H.Q. is rather ambiguous and it has been decided to ask for a more definite statement of the position.

A communication has now been received from the VK5 with a request that Federal Headquarters take over the affairs of this Division and enrol its members in the new body to be formed and known as the Wireless Institute of Australia whose office-bearers will be members of the Federal Executive.

The VK6 Division reports progress in its efforts to obtain permission for the inauguration of an Emergency Communication Network similar to that of the New South Wales Division.

A very generous donation has been received from Mrs. A. Campbell, mother of "Snow" towards the Prisoner's of War Fund and Federal Headquarters take this opportunity of publicly thanking her.

THE EMERGENCY COMMUNICATION NETWORK

Considerable progress has been made during the past month and it is anticipated that the Control Station will be heard testing very soon.

The construction of the racks and chassis is now completed and every station received its quota of equipment. Circuit diagrams have been posted to the amateurs concerned in the construction of the various stations whilst applications for the release of equipment to approved personnel have been forwarded on to the necessary authorities.

The recent custody order raised doubts in the minds of many amateurs as to how the Emergency Communication Network would be effected but fortunately any misgivings were quickly dispelled.

Unfortunately for reasons of Security it is impossible to give a list of the stations that will be operating and the personnel that will be attached to each, but it may be said that those amateurs who have been enrolled represent a cross section of Australian Experimenters. The Dx hound, 5 metre enthusiast, 40 metre "ragchewer", "one band hams" low power birds and high power merchants are all banded together with one object in mind, Service to the Community. Every member of the E.C.N. realises that the Network will not be an opportunity for a glorious ragchew - the mistake made by some reckless amateurs in the States, and that the future of amateur radio in Australia rests to a large degree in his keeping. He is determined that no action of his will bring discredit upon the Australian Experimenter and knows that the boys "up there" look to him to keep the flag flying and the bands wide open for the time when "73's om" will once more girdle the world.

--o00o--

NEW SOUTH WALES DIVISION

The attendance at the September Meeting of the Division reflected the re-awakened interest in ham radio that has been brought about by the formation of the Emergency Communication Network in this State. Quite a number of old faces were seen again whilst several newcomers made their presence felt.

Naturally the main topic was the recent instruction issued by the Radio Inspector's Department regarding the custody of sealed containers and Federal Headquarters and the State Council were complimented upon the prompt action that was taken in this matter. Members were informed of the assistance rendered by the Senior Radio Inspector in an endeavor to facilitate the smooth working of this regulation.

Several vacancies existing upon the State Council have now been filled by the election of Messrs. A.V. Bennet VK2VA, P. Dickson VK2AFB and R. Smith VK2AIU. Messrs. Dickson and Smith are newcomers whilst Mr. Bennett served for a time on the Council several years ago. These three new members of Council are keen hams and the Division should benefit by their election.

It was decided that the October General Meeting be given over to a Picture Night in aid of the VK2 Prisoner's of War Fund. This was made possible by the generosity of Mr. Vince Bennett VK2VA who has promised to make available projector and films for the night. The star attraction will be? I'd like to tell you but --. This function, that will take place on 15th October, will not be confined to members only. You are asked to bring another ham, the YL,XYL or OW. Remember, the greater the number present the more parcels for P.O.W's.

A very interesting talk on "How to Run a Kilowatt on a Single 35T" was ably delivered by an American visitor Dave Hardaker, W6PIZ. This was much appreciated by Members including two other visitors, 30J and 3TE. Dave joined the Navy "to see the world" but saw more than he bargained for up and around VR4!

Another very illuminating talk was given by Perce Dickson VK2AFB on some very interesting foreign valves that had been "picked up" in Libya.

No don't forget chaps October 15th is Picture Night for the P.O.W. and bring a friend or two.

-----XXXXXXXX-----

VICTORIAN DIVISION

There was a good attendance at the last meeting of the Victorian Division, several visitors being present.

Among the visitors were VK4AW, VK4WJ, and VK6AF.

Keith Hatch, one of the Division's members who was on the H.M.A.S. Canberra when she was sunk, was also present, and gave a short talk on his adventures. He still wonders why Tulagi remains above the sea level, considering the amount of metal which landed on the island.

VK3IR who was on the Nestor when she was sunk in the "MED" was also present, but he could not be persuaded to talk.

VK4AW has been playing a little golf and succeeded in placing a ball in the Albert Park Lake, which according to VK4WJ is a little tough considering the fact the golf balls are getting very hard to get. VK4AW congratulated the Division on the attendance at the meetings, he hadn't expected to see so many present.

The Prisoner's of War Fund is coming along fine. At the last meeting 12/- was collected, and we acknowledge since a donation from one of our members of £1/1/-. Together with 14/- collected at this meeting, there is a total of £2/7/-. Anyone wishing to contribute to the Fund can do so by forwarding their contribution to the Treasurer.

3RQ.. Flight Sgnt. Morry Quick was present at the meeting and expects to go interstate very shortly.

3Z.. has had an attack of the common complaint--measles. Now sports three stripes.. just for being in hospital.

30F.. is now in one of the navy depots in Victoria.

3VH.. is well in the tropics..spending some of his spare time swimming. Someone shot a 12 foot "croc" where he was in the water.

3ML.. is still in the North East Area, and is now a Wing Commander.

3UK.. is also a wing Commander and is Director of Signals. Nice going Vaughan.

3NY.. is spending a few weeks in the country relieving in the bank. Just wait till he sees this magazine???

3EP.. Is now attached to an R.A.A.F. Armament School.

3EK.. Corp. R. J. Bell R.A.A.F. is at present in ward 7A Heidelberg AGH.

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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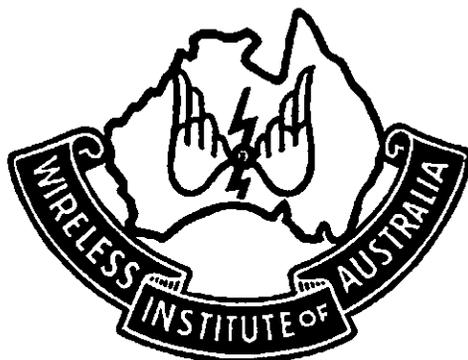
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SIXPENCE

NOVEMBER 1942

AMATEUR RADIO

THE
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OF THE
WIRELESS INSTITUTE
OF
AUSTRALIA



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Vol. 10 No. 11

November, 1942.

RESISTANCE CAPACITY OSCILLATOR.

... By Don Reed, VK2DR. ...

Here's the dope on a handy little gadget to use in conjunction with your BC set to convert it into an audio oscillator.

Nearly every ham is called upon to give a spot of code practice these days, and this little adaptor will make it simple to get a nice sweet audio tone from your receiver.

Apart from code instruction purposes the feedback principle outlined below may readily be utilised in design of a service oscillator. There's no need to waste A.R. space by going into all the useful applications an audio oscillator can be put to, so lets get down to business .

First of all, please excuse me for delving into fundamentals a bit. It is chicken fodder to most Institute Members; but I'll get myself tied up if I don't start from the beginning...

A vacuum tube will oscillate if the output voltage, already 180 degrees out of phase with the control grid voltage, is made to change phase a further 180 degrees and fed back to the grid, PROVIDED that the voltage fed back exceeds the reciprocal of the gain of the tube.

Changing phase sounds difficult but actually its a snack. It has already been pointed out that grid and plate voltages are 180 degrees out of phase. Now a further phase rotation of 90 degrees exists between plate and earth. If we tap off half way between plate and earth then the rotation is only 45 degrees instead of 90. Simple.

To decide the required frequency of audio oscillation is the next step. For testing purposes 400 cycles is the most useful frequency as it is the generally accepted standard. For code practice most of the boys like 500 or 600 cycles best. Lets take 600 cycles as our example.

The reactance of a condenser of (say) 0.01 mfd at 600 cycles is near enough to 30,000 ohms. If the condenser of 0.01 mfd capacity and a resistor of 30,000 ohms are connected in series

between plate and earth it is apparent that the reactance of the condenser will be the same as the resistance of the resistor at the frequency of 600 cycles. Take a tapping from the centre of these two and presto, there's the 45 degrees.

So far we have 180 degrees (grid to plate) plus 45 degrees which equals 225 degrees, just 135 short of the 360 degrees required. 135 is three times 45 so just connect up three more condenser resistor combinations and 360 degrees phase rotation is in the basket. SEasy. Feed it back to the grid and provided the voltage gain in the tube is sufficient to overcome the losses in the feedback network a nice clean sweet 600 cycle note will be forthcoming.

In the above example, unless the voltage gain of the stage is over 16 there will be insufficient feedback to generate oscillations. That is easily explained if we consider that by tapping down the first condenser resistor combination half way we are only obtaining half the A.C. voltage, the next combination reduces this figure to a quarter and so on until 1/16th of the voltage is available at the centre point of the fourth combination.

Any Screen-grid or Pentode voltage amplifier will have ample gain in hand to do the trick. Even some power amplifier pentodes will perk OK.

Well thats the principle of operation. Oh no, its not original. It was first suggested in an article appearing in Proc. I.R.E. (USA) back in 1938 but possibly some of the gang are not wise to it yet.

Working out reactance values of condensers puts a nasty taste in the mouths of those of us not mathematically inclined, so to avoid the grind here's a useful rule of thumb.

A condenser of 1 mfd has a reactance of approx 400 ohms at 400 cycles. (389 ohms to be exact). Reactance varies inversely with frequency and with capacity,

$X_c = \frac{1}{2 \pi f C}$ so it is easy to mentally pick out the approx reactance of a large range of condensers at various frequencies by applying the above rule.

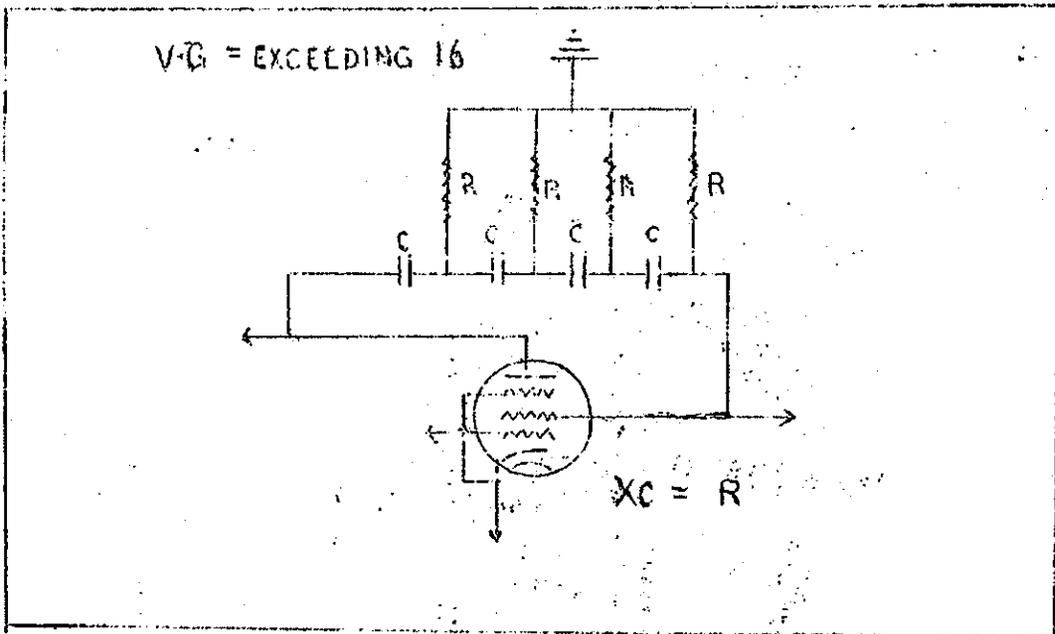
For example, if 1 mfd at 400 cycles	=	400 ohms	
then 0.1 " " " "	=	4000 "	
0.01" " " "	=	40000 "	
.01" " 600 "	=	30000 "	$(\frac{40000 \times 400}{600})$

above are approximate values but quite near enough for all practical purposes. After all, manufacturers don't forget the margin of deviation from standard allowed in their components before putting them on the market!

When buying resistors and condensers for the above network, try to get values as near to balance as you can, to keep the wave form generated as uniform as possible, and to keep near to the

required frequency, however the tube will oscillate even with quite large deviation from calculated values.

It seems a bit superfluous going into details of construction of an adaptor using the above principle. For the languid, I suggest using an old valve base with the four resistors and four condensers on top of it, a couple of terminals for a Morse key and a valve socket perched atop to take the Adapted valve of the B.C. set. Then it is a simple matter to lift out the audio valve, plug in the adaptor with the valve on top, hook up the key and you're away.



July issue of Q.S.T. informs us that the A.R.R.L. has succeeded in obtaining permission for the establishment of the War Emergency Radio Service. The framework closely resembles that of the Emergency Communication Network here in New South Wales and main difference being that the frequencies to be used will be 112-116, 224-230 and 400-401 mcs. A very strict set of Regulations dealing with operations have been drawn up and incorporated in the F.C.C. Rules. Care has been taken to see that the state of affairs does not arise again when several thousand amateurs stations were reactivated after Pearl Harbor.

RESISTANCE NETWORKS SOLVED BY SUCCESSIVE APPROXIMATION.

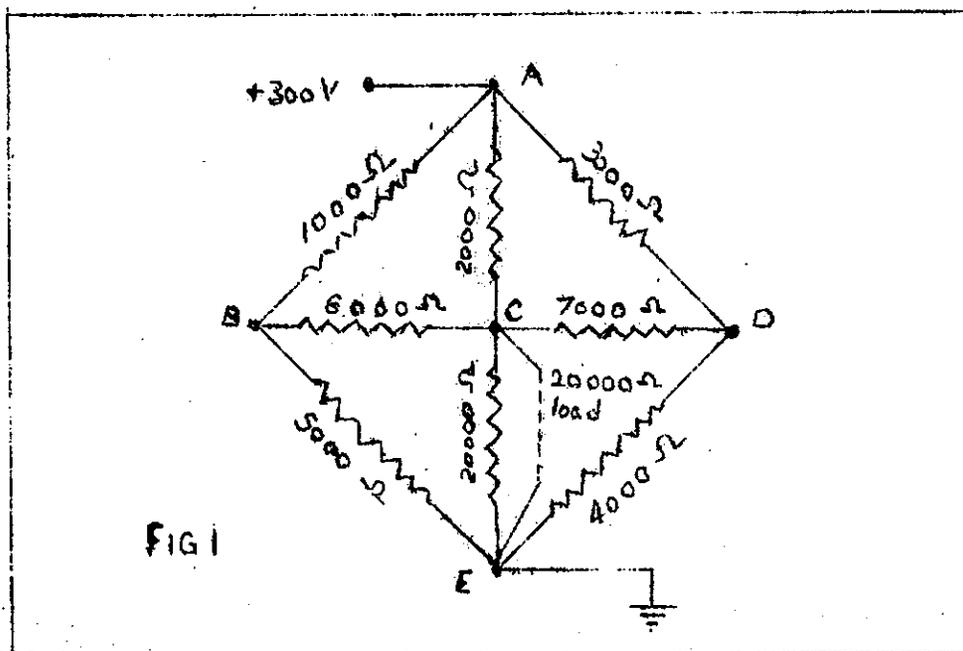
By R. A. PRIDDLE, VK 2RA.

The following method for the determination of current and voltage distribution in a network of known resistances was recently evolved at 2 R A and may be of interest. It may be applied to networks of any complexity without making circuit "transformations", and may be carried to any desired degree of accuracy.

Assume that the network shown in Figure 1 is to be investigated, with 300 volts applied between A and E, and a load of resistance 20000 ohms connected between C and E.

We require to find: -

1. The voltage developed across the load.
2. The total current drain from the 300-volt supply.



INITIAL STEPS:

- (a) Draw a reasonably large diagram of the network, treating the load as an ordinary resistor.
- (b) Calculate the conductivity ($\frac{1}{R}$) of each resistor and enter it on the diagram (e.g. for 6000 ohm resistance, conductivity = $\frac{1}{6000}$ mhos = 167 micromhos approximately).
- (c) Calculate for each joint the ratios of the conductivities of all the resistors connected at the joint (e.g. for joint C we have

conductivities of 167, 500, 143, 50 and (load) 50 micromhos - total 910 micromhos, so that the ratios are $\frac{167}{910} = 0.18$, $\frac{500}{910} = 0.55$,

$\frac{143}{910} = 0.16$, 0.055 and 0.055 approximately).

(d) Enter these ratios on the appropriate resistor at each joint. As seen later, these ratios may be considered as "distribution factors."

(e) Apply arbitrary voltages at each joint. A reasonable estimate, based on inspection, of the voltages likely to be present will reduce the subsequent work, but this is not essential to the accuracy of the method. In other words, any voltages may be assumed. In the present example, assume voltages as follows:-

- A. (known voltage) 300 V, B 250 V, C 250 V,
- D. 150 V and E (known voltage) 0 V.

(f) The current flowing in any resistor will now be $\frac{E}{R}$ i.e. $E \times$ conductivity, so compute the current for each resistor, showing currents as positive when flowing towards a joint and negative when flowing away from a joint. (e.g. in resistor C - D, current = $\frac{(250-150)}{1000} \times 143 = 14$ m.a. approx., and this is negative at C and positive at D since it flows from C to D). It will be found convenient to write the currents round each joint in some regular position. In the example this position is found by moving counter-clockwise from the resistor concerned, so that at the left end the current appears just above the resistor, at the bottom end it is shown just to the left of the resistor, and so on. When the above stages are completed, the diagram appears as in Fig. 2.

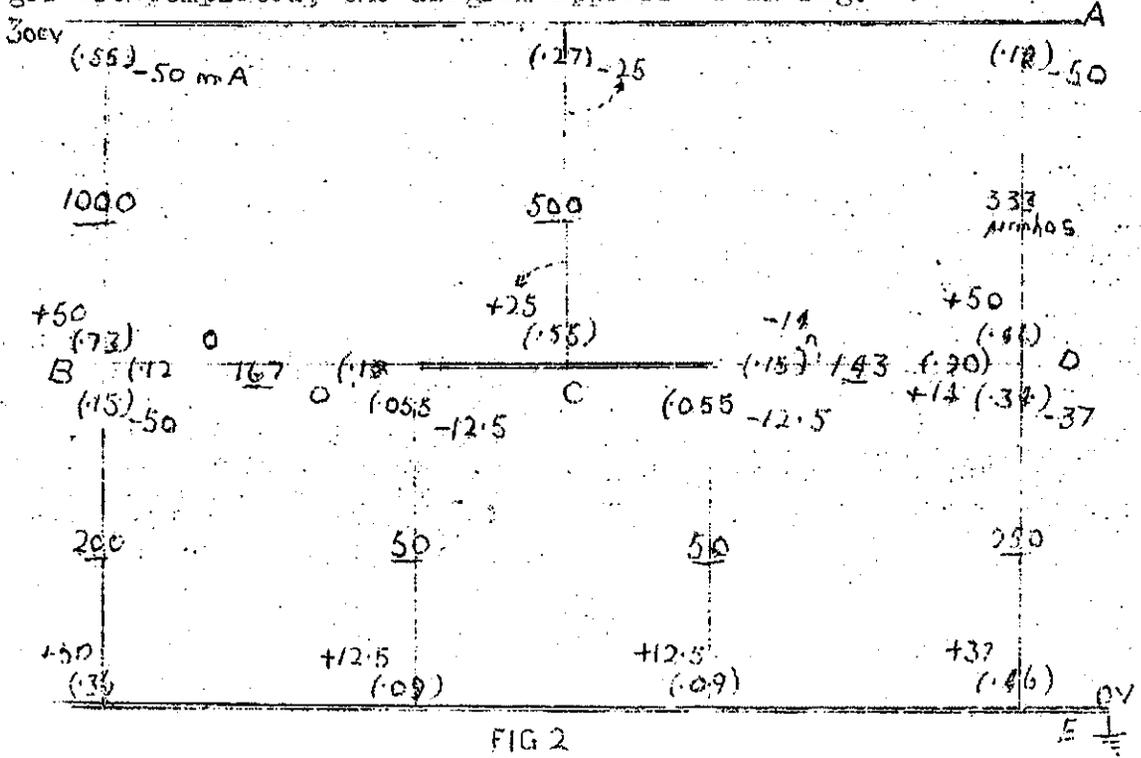


FIG 2



The currents in milliamperes shown on this diagram are the currents which would actually flow in the resistors if the joints were held at the potentials assumed in step (c).

However, a study of Fig. 2 shows that at any joint the total of the currents flowing towards the joint does not balance the total of the currents flowing away from the joint (e.g. at I, the positive currents flowing towards the joint are $\pm 14 + 50 = \pm 64$ ma and the negative current flowing away from the joint is $- 37$ ma, so that there is an excess current of ± 27 ma flowing toward the joint, which is impossible).

Suppose the potential of this joint to be raised by 10 volts, leaving all other joints at their original potentials. Then there will be induced changes in current of $10 \times 143 = 1.43$ ma towards C, $10 \times 333 = 3.33$ ma towards A and $10 \times \frac{250 \cdot 1000}{1000} = 2.5$ ma towards E. All these will be negative since they flow away from D. The total of these is $- 7.26$ ma, so to counteract the original unbalance of ± 27 ma we would need to raise the potential at D by $10 \times \frac{27}{7.26} = 37.2$ volts, giving current changes of $1.43 \times 3.72 = 5.3$ ma, $3.35 \times 3.72 = 12.4$ ma and $2.5 \times 3.72 = 9.3$ ma flowing towards C, A, and E, respectively. Note, however, that these currents can be deduced without first computing the voltage change, by merely "distributing" the unbalanced 27 ma. in the same ratio as the conductivities at D. Thus $27 \times 0.2 = 5.4$ ma, $27 \times 0.46 = 12.4$ ma and $27 \times 0.34 = 9.2$ ma. The apparent discrepancies of 0.1 ma are due to the approximations made in step (c). The ratios 0.2, 0.46, 0.34 are seen to be current "distribution factors."

By entering the above negative current changes in the appropriate position on the diagram, the currents at Joint D will be temporarily balanced.

Now in resistor D C, the current change of $- 5$ ma flowing away from D also means a current change of ± 5 ma flowing towards C, and similarly there will be current changes of ± 13 ma at A and ± 9 ma at E. If these current changes are "carried over" to the far ends of the respective resistors, another joint can then be "balanced" in a similar manner, and the process can be repeated until all joints are balanced, when the final current in any one resistor may be determined by adding all the partial currents found during the solution. The example shown in Figs. 1 and 2 will now be completed by performing "distributions" and "carry-over" as outlined above.

CONCLUDING STEPS:

(g) By inspection select the joint which has the greatest unbalance (± 27 ma at Joint D in the example). Choosing the largest unbalance makes the solution more speedy, but the same accuracy will be achieved whatever the sequence in which joints are balanced.

(h) "Distribute" the unbalanced ± 27 ma as shown above, and enter the current changes of $- 5$ ma, $- 13$ ma and $- 9$ ma on resistors D C, D A and D E respectively. Draw a short line above or below the entry to indicate temporary balancing of Joint D.

(j) "Carry Over" those current changes to the far ends of the appropriate resistors.

(k) Again select the greatest unbalance (- 9 ma at Joint C in this example).

(l) "Distribute" this unbalance by using "distribution factors" ($9 \times 0.18 = 2$ ma from B, $9 \times 0.55 = 5$ ma from A, $9 \times 0.16 = 1$ ma from D and $9 \times 0.055 = 0.5$ ma from E in 20000 ohm resistor and also in the load).

(m) "Carry over" these current changes to the far ends of resistors.

(n) Repeat (k), (l) and (m) for the - 2 ma unbalance at Joint B.

(p) Repeat (k), (l) and (m) for the - 1 ma unbalance at Joint D.

At this stage, working to the nearest 1 ma, all the joints are unbalanced.

(q) Add the partial currents at each end of each resistor and put circles round the totals for clarity. The currents so found should be equal at each end of any resistor but opposite in sign, and they will be the currents actually flowing in the network. At this stage the complete network appears as in Fig. 3.

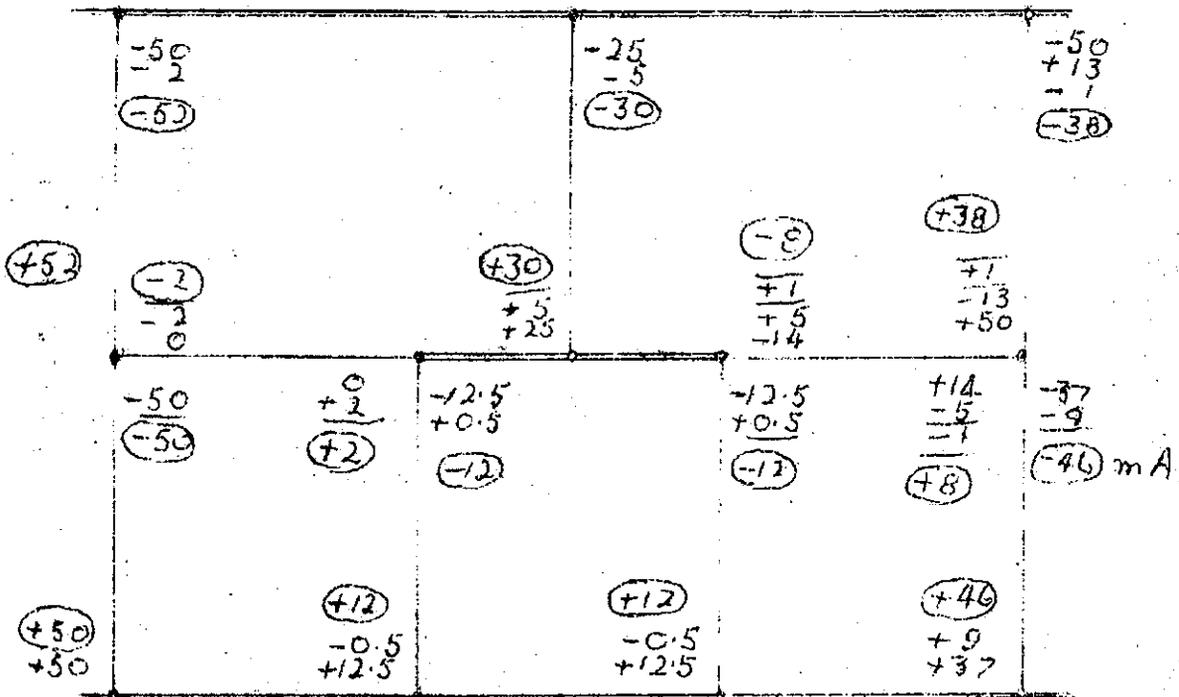


FIG 3

reliminary information obtained from steps (b), (c), (d) and (e), which appears on Fig 2, has been omitted for clarity.

Voltages may be readily determined by application of Ohm's Law, thus:-

(r) Voltage developed between VC and E is $\frac{12 \times 20000}{1000} = 240$

volts which is the first answer required.

(s) Current drain from \div 300 volt wire is $52 \div 30 \div 38 \text{ ma} = 120 \text{ ma}$ and as a check the current flowing into earth wire is $50 \div 12 \div 12 \div 46 = 120 \text{ ma}$ so that the total drain from the supply is 120 ma. This is the second answer required.

The accuracy of these answers is better than $\frac{1}{2}$ per cent, although several approximations have been made.

CONCLUSION:

The method outlined above may appear to be very complicated, but with the aid of a slide rule the network can be solved in less time than it takes to describe.

The degree of approximation to be allowed depends on the accuracy required in the final answer, and networks of any complexity can be solved to any accuracy desired. For results within, say 5-10 per cent one "distribution" at each joint will usually be sufficient, especially if the original voltages assumed in step (e) are chosen carefully.

A slight variation in the method which is often advantageous, especially in symmetrical networks, is to "distribute" at all the unbalanced joints before "carrying over" and then "carry over" throughout the network. This method is preferred where an approximate solution is to be found by making only one "distribution" at each joint, as no "carry over" is then necessary.

It is suggested that readers test the effect of various assumptions of voltages (step (e)) and different sequence of joint distribution (step (g)) by solving a combination of say four equal resistances in series. The "distribution factors" will obviously be 1 at each outer end and $\frac{1}{2}$ at each side of each intermediate joint. Assume voltages of say 100 - 75 - 50 - 25 - 0; 100 - 100 - 100 - 100 - 0; 100 - 0 - 0 - 0 - 0; 100 - 50 - 50 - 50 - 0 and complete the solution in each case. It will be found that the same final answer will be reached in each case, but that the number of operations required will vary, depending on how closely the initial assumptions agree with the correct voltage distributions.

It is not suggested that resistances in series or resistances in parallel should be solved by this method, but for more complex layouts some merit may be found in "Current distribution."

SLOUCH HATS and FORAGE CAPS

By VK2YC

News this month consists of just nothing, the only way to portray that is a nice blank page adorned with an ugly looking question mark, and "THIS MEANS YOU." But that is not fair to some ham way out in NW Australia waiting for any kind of news, particularly some about his former QSOs. For the last couple of months I have carefully refrained from approaching the few consistent chaps who can always be relied on for news and the result is "just nothing." Now chaps the ham game has always been, and will always be what we all, collectively and individually, make it. And Amateur Radio is at the moment our only barometer of that interest, and gloomy WX ahead seems to be the prediction. Of course, I know you chaps in the Services are busy, but so are we who are unlucky enough to be as yet in these essential (whatever that is) services. Most of us contributing to this Magazine are at present doing about three other jobs besides. We, for what we think, the good of Ham Radio MAKE the time. ..how about YOU?

Where are all these State representatives that were to be appointed to collect news for this column....so far not a line has reached this address. Anyway think it over during the next month or so and if there is no news forthcoming, we will take it you members of the W.I.A. want this page discontinued.

From VK2 HC I learn he has forsaken Bradfield and is now stationed at Wagga. His "boss" is his cousin and one time pupil in Ham Radio, Johnny Traill of 2XQ. Ray you might remind Johnny about that "Malaya feature" for my column, sling your weight about. Hi! Sgt. Patrick who trained many a VK ham at Ultimo N.S.W. is, I believe also stationed there.

Bill Lewis 2 YB/6YB...A W/O when I last saw him has started the next generation of the Lewis family with a daughter. Congrats Bill, om, Ruth and I want the formula when you next come down from VK4.

Ray Jones 3RJ has once more forsaken VK2 for VK3 so once more I have to type my own notes. You know thinking of the RAAF gives me a good idea. If only Vaughan could remember he was once a keen contributor to Amateur Radio he could tell us just where everybody is, and think what an easy job filling this column would be then.

2ADE once 4US is back in Australia, getting back almost as quick as a letter he posted in January last. Reading the RSGB Bulletin I notice one thing he did not tell us in his letter. He was married to an English girl while he was away. Congratulations Chaz. om...every happiness to you both.

2ADE went away with No. 10 Squadron over two years ago, being among the first of the RAAFWR to get away. He seems to have had a

pretty hectic time during those 1200 flying hours of his. Naturally for security reasons, very little can be told till after the War. During one of the periods of duty in the Middle East, where if I remember rightly he was wounded slightly, he contracted dysentery, a very easy thing to do over there and spent three months in hospital. Then he broke five ribs and went back again and there must have been something about the nursing in that hospital, for otherwise its hard to discover why he at once broke all five ribs just (apparently) to return for another month or so. Gee, Chas. I hope you've told your wif this story. Hi!

2ADE really is one of those chaps most Hams in the Services hope to be,....a chap who has met his DX. To use his own words, he has met SP/OK/SV, SW/ FB/La/PAO 7 heaps of others plus a "few" yanks (shades of 40 & 50 M) and VE's. He is enthusiastic about his meeting with G hams, G3IG, G2MI and G6CL being especially mentioned as "kindness personified," so apparently there is some Ham Spirit over there, right enough. And now, VK2ADE is back home again where, quoting him again "one can have a real sleep in bed without the feeling of tension and of being keyed up all the time.

Fl/Lieut Fred Bibby 301 spends his working hours with the RAAF somewhere in VK3; while 3DU Lieut. Stewart Embling is attached to SO in G's Staff at LHQ. One of VK3's old 200 metro experts 3FW sports a pair of stripes on a R.A.F Uniform, stationed at Headquarters. 2AHY Eric Martin was seen in VIM recently. Eric is a member of the RAAF and expects by this time to be in VK2.

It seems to me that most of the VK3 Hams are in the RAAF 'cause 3RC, Roy Streeter is an LAC stationed in Australia's near north, and another of the VK3 Old Timers of the 200 Mx band, 3TM has recently enlisted; 3XW, Fl/Sgt Blyth is in VK2. Still another 200 Mx merchant Len Menear has joined the RAAF. Ivor Stafford one of VK3's low power experts is a corporal of the RAAF and is now somewhere in the Northern Territory.

Keith Hatch late 2nd Op at 3AM entertained the VK3 meeting recently with an account of his escape from the HMAS Canberra. Keith was full of praise for the members of the US Naval personnel on the destroyer which took them off the sinking Canberra.

Corporal H.A. Vinning 5VG of sale has returned from service in Egypt, Greece and Crete, but was quickly stationed somewhere in Australia.

Lastly but most importantly....where is YOUR news...you've read what others sent in...how about what you know. Sources of supply kept confidential if comments humorous and not malicious HI.

2YC 78 Maloney St.,
EASTLAKES. N.S.W.

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

.. Federal Headquarters ..

During recent weeks it has been brought under the notice of Federal Headquarters certain proposals for the re-organisation of the Radio Trade, particularly that section dealing with the Servicing of Receivers, that have been placed before the Department of War Organisation of Industry, by a section of the Radio Industry.

Like all other industries, Radio is being combed in an endeavor to conserve Manpower and make any surplus available for the Forces, but if the suggested proposals were to be adopted in their present form, it would mean that a monopoly would be created, in so far as the right to do Service work and the ability to obtain replacement parts was concerned.

Briefly the suggestions, it is understood, are as follows:- That all States are to be Zoned. Each Serviceman to be given a Zone. That all Servicemen are to be Licensed. They will be the only persons permitted to obtain Spare parts. That Licences will only be issued to certain Trade Organisation.

Of course it is realised that in some areas there are quite a number of Servicemen and in others insufficient to carry out repairs and generally keep a Receiver in good working order, and the suggestion that each Serviceman be given a definite zone to be responsible for, has its advantages, but nevertheless the fact is lost sight of that to-day, quite a number of Licensed Experimenters are carrying out Service work in their spare time and if it is proposed to disregard these Amateurs an additional burden would be thrown on the Licensed Servicemen so much so that it would be doubtful if any could be released for war work.

The main objection to these proposals is the suggestion that only Licensed Servicemen will be able to obtain spare parts. It is understood that this suggestion was made in an endeavor to prevent the building of new Receivers by means of kit sets! Actually it means that any person with some knowledge of Radio finds that a Resistor or Condenser, value less than 2/- in many cases, has broken down making his Receiver inoperative. He cannot purchase a replacement. He must call a Serviceman. This is the case of Mr. General Public. Consider Bill Jones, VK2XYZ Licensed Experimenter, B.sc. B.E. etc. possessing more Technical ability, knowledge and practical experience than the average Serviceman. He is placed in the same position as a member of the public, having little or any knowledge of Radio!

Federal Headquarters has written to the Department of War organisation of Industry pointing out the part-time Service work

that is at present being carried out by Amateurs in the interests of the community and asking that they be considered should it be decided to issue Licences. A strong protest was lodged against the proposal that only Licensed Service men should be able to obtain spare parts and it was suggested to the Minister that should he deem it necessary to control the sale of spare parts any person desiring to purchase these components should make a declaration that they are for replacement purposes only.

.....

The Emergency Communication Network.

By the time that Members read this it is anticipated that the Network will be in full swing. Permission has been granted for the release of the necessary equipment and a considerable amount of activity is everywhere apparent. As one member of the R.I.'s staff put it "The YLs and XYLs have had a break since 1939 but now its starting all over again."

For the benefit of those Members at present on the Reserve of Operators here is a brief description of the outlying stations. The transmitter is a four stage crystal controlled rig using three 6F6's or equivalent type with an 807 as a P.A. Before deciding upon this line up many types of "trick circuits" were considered, but eventually it was decided that the stability of a straight out C.O. far out-weighed the "advantages" of other types. The R.F. Section is mounted on two separate chassis, the Driver stages on one chassis and the P.A. on another. The Receiver is a super-regen, with a stage of R.F. using 3 type 6J7's and a 6F6. The audio end of the Receiver is used to modulate the 807. Two power supplies are provided for, one of which is independent of the A.C. Mains. The Antenna is a three element beam. These units are enclosed in a Rack.

The control station is a higher powered transmitter using 808's (running stone cold unfortunately) and the antenna is a full wave Zepp 85 feet above ground.

When all installations are completed at Control members of the Network will be given an opportunity of inspecting the Radio Room.

Here is a list of Amateurs at present actively engaged in the scheme:-

H. Peterson	VK2HP	W.P. Nelson	VK2KH	A.M. Moss	VK2QY
H.P. Mulligan	VK2ABH	P.G. Feeny	VK2AKX	G. Littlefair	VK2KV
I. Bailue	VK2TN	G. Paterson	VK2AHJ	P. Cox	VK2IE
G.W. Dukes	VK2FD	G.F. Cole	VK2DI	A. Bennett	VK2VA
E.G. Pugh	VK2ADK	L. Tanner	VK2ABL	G. Waldoek	VK2QU
G.H. Sheolwy	VK2 QF	J.P. Keane	VK2JN	A.J. Springett	VK2OM
P. Dickson	VK2AFB	W.G. Ryan	VK2TI	R.A. Priddle	VK2RA
E. Hodgkins	VK2EH	E. Fallowfield	VK2AKI	T.W. Barnes	VK2ABI

L. Mashman	VK2OB	E. McCredie	VK2EV	K.F. Handel	VK2IA
R.J. Smith	VK2AIU	G. Caletti	VK2AHV	W. McElrea	VK2UV
C. Fryar	VK2NP	D. Dunn	VK2EG	J. Thompson	VK2XP
E. Treharne	VK2AIQ	R. Treharne	VK2AIQ	J. Davis	VK2AFY
J.H. Patterson	VK2AFG	H. Lapthorne	VK2HL	D.W. Reed	VK2 DR
J. McNamara	VK2EQ	R.W. Patterson	VK2AJW	J. Georgeson	VK2AKU
E.J. Dark	VK2ADQ	R. Mondel	VK2	H. Mondel	VK2

News is to hand that the South Australian Division have been successful in obtaining permission for the formation of an Emergency Communication Network in that State.

.....XXXXXXXXXXXXX.....

NEW SOUTH WALES DIVISION.

The October General Meeting of the Division was given over to a Picture Night in aid of the VK2. Prisoner's of War Fund. Unfortunately the attendance was not as large as anticipated due to the drought breaking rains experienced during that week, but nevertheless the sum of £12/17/- has been raised to date and subscriptions are still coming in. Hats off to the brave band of XYL's who braved the elements in order to be present. The show was made possible through the generosity of Messrs. Noad and Bennett and they are to be complimented upon the fine programme prepared particularly "North Sea."

A recent visitor to VIS was Staff Sergeant Cec. Horne VK2AIK of the 13th. Garrison Battalion. Cec was at one time Divisional Secretary, but decided to join up in an endeavor to obtain a little peace and quietness and to be free from worry for awhile. Cecil has been "holidaying" at a certain northern "tropical paradise." 2AIK has been having the time of his young (?) life, what with mosquitoes as big as Flying Fortresses and machine guns to keep the sharks at a safe distance.

Two other visitors were John Thorley VK4RT and Lieutenant Pat Kelly past secretary's of the VK4 Division of the W.I.A. The writer would like to know who spoilt a certain photographic effort so much so that the shutter failed to click!

A very welcome letter arrived a few days ago from Morry Lusby VK2WN who was at that time in the U.S.A. 2WN has been getting about quite a great deal and has travelled over 10,000 miles by air. On a visit to Radio City he was interviewed before the "mike" and gave a wonderful description of the "colony" that he lived in before the announcer realised that his leg was being pulled rather lengthily. This interview by the way, was from a television studio. Morry would like to hear from old friends and letters should be addressed to him C/o Australian Legation, Washington, D.C.

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VICTORIAN DIVISION

The Victorian Division's Membership has risen to almost pre-war level, a fact which leads one to believe that ex Hams are well aware of the work that the Institute is doing in looking after the interests of the Ham fraternity and radio in general. The Treasurer will be very pleased to see more membership fees in the mail.

Members are reminded that the next meeting of the Division will be held on the first Tuesday in December. Now don't slip up on that date its the FIRST OF DECEMBER.

The Victorian Division is considering the purchase of a reliable comptometer...for the exclusive use of Mr. H.N.Stevens VK3JO...Herb has been in very hot water over his adding up???? Maybe its the reason why he didn't show his face at the meeting... We suspect that he has been trying to bend water pipe over his knee, or perhaps he has been going down on his knees to one of the "snappy" VL morse students.

Keith Heitsch 3HK is now on shift work at the Box Hill exchange. We don't see very much of him these days, but we learn that Keith is interested in photography these days.

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WESTERN AUSTRALIAN DIVISION.

P/O Geo. Rann (VK6KO) writing from Queensland advises having seen quite a few VK6 Hams, also has met quite a number from other States, including many Yanks. Amongst the VK6's met over there are VK6MW, 6MM, 6BO, and 6FH, all have either received promotion or are in line for it. All are working in the Radio Location side of the R.A.A.F.

VK6KB . Keith Anderson called the other day sporting two stripes, says he has been roaming around the State; also advises (Bill Woodley) is spending a period in hospital - we wish him a speedy recovery.

Little news is received from the VK6 boys at the fronts, but those on the home front are anxiously awaiting the word to go from the Civil Defence Council. A scheme has been put forward for the use of radio in the event of communication breakdown, and after months of negotiation is only waiting final approval by the P.M.G's Dept. A committee comprising of Geo. Moss (6GM) Cliff Brown (6CB) and Chas. Quin (6CX) has been appointed by the Civil Defence Council. They hope to be calling shortly for assistance in this project from other Members.

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VICTORIAN DIVISION**

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VK2NG; R. SMITH, VK2AIU; R. MILLER.

The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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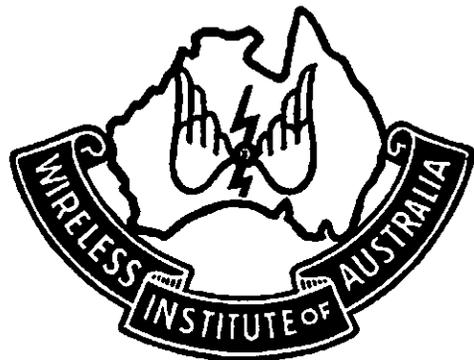
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SIXPENCE

DECEMBER 1942

AMATEUR RADIO

THE
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WIRELESS INSTITUTE
OF
AUSTRALIA



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Vol 10, No. 12

December, 1942.

A COMPACT PANORAMIC RADIO SPECTROSCOPE

ADAPTER.

(Taken from an article by George Grammer W1DF,
published in QST).

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Several months back we published some details of a "panoramic radio spectroscope" for use with communication receivers. This system has evidently aroused considerable interest and we have been asked for further details. A description of a "panoramic" adapter was published in QST for July and the following information is taken from this article. At first glance the circuit appears rather formidable, but it can be readily resolved into sections which are in themselves comparatively simple. The panoramic adapter to be described uses a 902 two-inch oscilloscope tube and, with the exception of the special RF transformers, the other components are easily obtainable and consist largely of tubular condensers and resistors.

CIRCUIT OPERATION...The complete circuit diagram is shown in Fig 1. Some of the output from the mixer tube in the receiver is fed to the first transformer T1, in the adapter unit through an isolating resistor R1, which is of high value to eliminate detuning and heavy loading. The 6SJ7 is a straight amplifier with the output transformer T2 tuned to the same frequency as T1, which is at the I.F. frequency of the receiver.

These transformers are both tightly coupled so that there is little attenuation for signals within 50 KC either side of the frequency to which the receiver is tuned. This requires more than simply adjusting T1 and T2 to give a flat-topped band 100 KC wide. A receiver having one RF stage has two circuits tuned to signal frequency and the selectivity of these circuits is such that a signal 50 KC off resonance will suffer considerable attenuation. At low frequencies the discrimination against a signal 50KC off resonance will be great but this would be considerably less at say 14MC.

The ideal condition is that which results in minimum amplitude discrimination from the antenna to the mixer in the adapter circuit.

Therefore T1 and T2 must be adjusted to compensate for the selectivity of the RF circuits in the receiver. Since the RF circuits will boost signals at the center of the band and attenuate those at the edges, T1 and T2 must be adjusted to have a stage selectivity characteristic which has a dip at the center and shows distinct peaks 50KC either side of the center. In practice such compensation can be secured at only one frequency, since the RF selectivity varies with frequency. In practice compensation is made practically 100% in the 3 MC region, accepting the unavoidable undercompensation at low frequencies and overcompensation at higher frequencies.

The gain of the first stage in the adapter is controlled by R2 which is needed to prevent the stronger signals from exceeding the limits of the cathode-ray tube screen and to compensate for variations in RF gain in the receiver.

POWER SUPPLY ... The power supply is somewhat unconventional as it uses a full wave voltage doubling circuit grounded at the center, thus giving the correct plate voltage for both the amplifier tubes and for the cathode-ray tube. Only a single winding delivering about 300 volts AC is required on the transformer.

OSCILLATOR FREQUENCY MODULATION... The oscillator circuit used is a Hartley operating at a center frequency of about 356KC (actually the receiver intermediate frequency minus 100KC) this frequency is varied plus and minus 50KC by the 6AC7 reactance modulator. The reactance modulator is of the variable inductance type, the RF control voltage for the grid being taken across C17. The low frequency control voltage (sweep) for the modulator is applied across C19 through isolating resistor R42 to the grid of the tube. The amplitude of the sweep voltage and hence the frequency band covered by the oscillator is adjusted by the sweep control potentiometer R35.

I.F. AMPLIFIER... The IF Amplifier is tuned to 100 KC. The transformers are designed so that the band-pass is something less than 10KC. The greater the selectivity of this circuit the higher the "resolution" of the system--that is, the ability to show as separate peaks on the cathode-ray tube screen signals differing in frequency by only a few kilocycles.

The 100KC output of the IF amplifier is applied to one diode plate of the 6SQ7 final detector. The rectified output voltage of the diode is applied to the grid of the triode section of the tube through R14. The triode section thus acts as a DC amplifier and is biased by the rectified voltage from the diode. Headphones can be plugged into J1 for audio monitoring.

SWEEP GENERATOR... The sweep generator uses double triode 7F7, one section being used as an oscillator and the other as an amplifier. The oscillator circuit is the ordinary feed-back

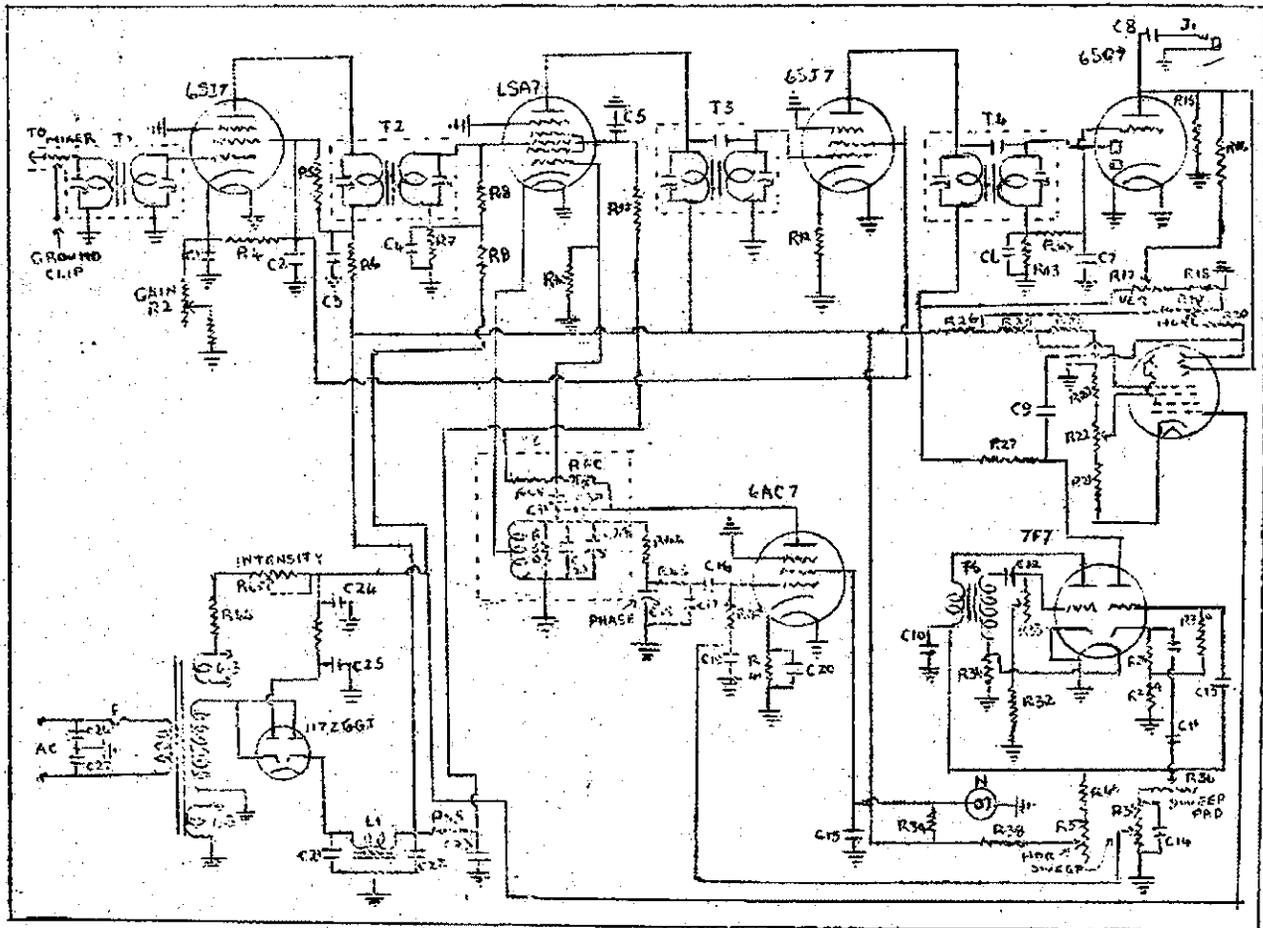
arrangement using a midget audio transformer, the frequency being adjusted by means of the variable grid-leak formed by R33 and R32 in series. To lock the oscillator at 30 cycles, the desired sweep frequency, a small amount of 60 cycle voltage is taken from the ungrounded side of the 7F7 filament and introduced into the grid circuit. Because of the large amount of feed-back, the oscillations are of the blocking type, consequently the plate current occurs in pulses. A gradual build up of voltage across C10 forms the saw-tooth voltage wave which is coupled to the grid of the second section of the 7F7. C10 discharges rapidly when the oscillator draws plate current, so that the 'fly-back' time is negligible enough to make the return trace on the oscilloscope screen invisible.

Part of the plate load R29 of the saw-tooth amplifier is placed in the cathode circuit, and the saw-tooth voltage developed across it and the cathode bias resistor R28 is utilized to control the reactance modulator and thus sweep the oscillator frequency over the desired frequency band. The amplitude of this voltage is adjusted so that with R35 at maximum it is just sufficient to swing the oscillator frequency over a 100KC band. R35 is a panel control of the sweep amplitude and hence of the width in frequency of the Rf band being scanned. The band can be spread as much as desired by means of this control.

CATHODE-RAY TUBE CIRCUIT...The voltage for this tube is obtained by connecting the two power supply filters in series. Thus the cathode is 300 volts negative with respect to the chassis and the ground point comes midway on the voltage divider. R27 supplies adjustable negative bias for the control grid and thus varies the intensity of the pattern on the screen. R22 controls the focusing. The position of the pattern on the screen can be adjusted by varying the voltage to the vertical plate by R17 and R18 in series and that for the horizontal plate from the potentiometer R19. In both cases isolating resistors (R16 and R20) are necessary to prevent short circuiting the AC voltages which are also applied to the deflection plates.

LAYOUT AND CONSTRUCTION...The adapter described was built in a cabinet having outside dimensions of $7\frac{1}{4}$ x $10\frac{1}{2}$ x $4\frac{1}{2}$ inches. The chassis base is $1\frac{1}{2}$ inches from the bottom. The screen of the cathode-ray tube is provided with a hood to exclude stray light and also has a frequency scale mounted across the lower edge. The scale has ten equal divisions representing 10KC intervals. The four panel controls (the ones needed in regular operation) are R19, R35, R27; and R2.

The socket for the 902 is mounted on a vertical metal plate the top of which is bent over to cover the high voltage leads to the socket. The socket is mounted so that it can be rotated through an arc of about 20 degrees, so that the deflections can be made actually horizontal and vertical. A shielded cable is used to connect the



- C1,2,3,4,5 :
- C8,15,20,26 :---0.01mfd.600v
- C27.
- C6,c7,C14.....500mmfd Mica
- C9,C13.....0.05mfd 400v
- C10.....0.1mfd 400v
- C11.....0.25mfd 400v
- C12.....0.01mfd Mica
- C16.....100mmfd Mica
- C17.....30mmfd Mica
- C18.....1-10mmfd mica pad
- C19.....250mmfd Mica
- C21,22,23.....10mfd electrolytic
- C24,C25.....4Mfd electrolytic
- C28,C31.....100mmfd mica (in
osc unit T5)
- C29.....30-240mmfd mica
(padder (in Osc T5))
- C30....500mmfd mica (in osc unit T5)
- R1,16,27....0.25 meg
- R2.....10,000 potentiometer
- R3,12,31...200 ohms
- R4,43,44...50000 ohms
- R5,29.....25,000 ohms
- R6,7,28,45...5000 ohms
- R8,16,21,23...0.1 meg
- R9,13,14,38,40...1 meg
- R10.....0.11 meg
- R11.....45,000ohms
- R15,R32.....0.5 meg
- R17,35,27.....0.1 meg Pot
- R19,R32.....0.25 meg Pot
- R20,R30.....2 meg
- R24.....25,000 ohms
- R25.....33,000 ohms
- R26.....See note
- R31.....500 ohms
- R33,36,37.....1 meg Pot
- R39.....75,000 ohms
- R41.....1000 ohms
- R42.....0.2 meg
- R46,48.....10,000 ohms
- R49.....3000 ohms (in osc
unit T5)
- R50.....25,000 ohms (in osc unit T5)
- T1....RF input transformer 456KC
- T2....RF interstage transformer 456KC
- T3....IF input transformer 100KC
- T4....IF output transformer 100KC
- T5....Oscillator transformer 556KC
- T6....Saw-tooth oscillator transformer
(2:1 or 3:1 midget audio)
- T7....Power transformer 300v..40 M/a.
- L1....Filter choke 40ma 350 ohms
(app 5-10 henrys)
- F.....2 amp fuse
- S1....Toggle switch (on R47)
- J1....Open circuit jack
- N..... $\frac{1}{2}$ watt neon bulb without base resistor
- RFC.... 30 mh r.f. choke (in osc unit T5)

NOTE:- R26 need only in case horizontal positioning control (R19) is critical in adjustment or total plate voltage exceeds 300, approximately. It may be omitted in this circuit, the junction of R2 5 and R19 being connected directly to B positive.

OF INTEREST: The B.B.C. broadcasts 97 news bulletins each day. During the different broadcasts a total of 40 different languages are used.

unit to the receiver. This cable has the isolating resistor R1 mounted at its free end so that it will be as near the mixer (in the receiver) plate as possible.

TESTING AND ALIGNMENT...Adjustment of the unit involves a number of operations, but most of them are quite straightforward. First check the power supply. The positive of C22 to ground should be about 300 volts and the same voltage should appear between the negative terminal of C25 and chassis. The total voltage between these two 'high' points should be 600. Screen voltages on the two 6SJ7 tubes should be approximately 100 (at full gain).

It is a good idea to put the cathode-ray tube and the sweep generator into operation, and these can be used in alignment of the RF and IF stages. The sweep generator should give no difficulty, although it will be helpful to check the shape of the saw-tooth if an oscilloscope is available for the purpose. The saw-tooth should be reasonably straight and the fly-back time or horizontal duration of the vertical part of the saw-tooth, should be very short. Should the oscillator not operate at all (no pattern on the oscilloscope screen) reverse the leads of the plate winding of T6.

With the saw-tooth oscillator in operation apply voltages to the 902. A horizontal line should be obtained on the screen focusing and intensity being adjustable by means of R22 and R47 respectively. Width and position of line are adjusted by means of R37; R19 and R17. Set the line well towards the bottom of the screen, since all vertical deflections will be upwards.

R.F. AND I.F. ALIGNMENT...The IF should be lined up first, using a test oscillator and tuning the trimmers on T3 and T4 for maximum response. At resonance the line on the 902 screen will move upwards and when T3 and T4 are completely in resonance it may be necessary to decrease the test signal to keep the line on the screen. T1 and T2 are lined up using a test oscillator tuned to the intermediate frequency in the receiver. The next step is to adjust the oscillator sweep. With the test oscillator at the receiver IF frequency, say 456KC, and with R36 at about half scale, slowly increase R35 from zero. As the amplitude of the sweep voltage applied to the grid of the 6AG7 reactance modulator increases, the pattern on the cathode-ray tube screen should change, showing the signal as a hump on the horizontal base line, which should move downward to the position it had originally when no signal was applied to the horizontal plates. A suitable height for the signal trace can be obtained by adjustment of the gain control R2.

Should the signal trace not be in the center of the screen or should it move horizontally as the sweep amplitude is increased, adjust C29 while varying R35 until the signal remains fixed in position on the horizontal base line, regardless of the setting of R35. The signal will then not necessarily appear at the center of the screen but then can be adjusted by R19. The phasing control

(C18) is not critical and may be set at nearly maximum capacity.

With the 456Kc signal centered on the screen, tune the oscillator slowly towards 506KC, watching the horizontal movement of the signal trace, R35 should be set at maximum. At 506KC the signal trace should be at the edge of the screen; at 406KC it should be at the opposite edge. The sweep can be set at any desired figure between 100 and zero KC by R35.

In this test the amplitude of the signal trace probably will vary considerably as the input frequency is varied. The final step in adjustment is to align T1 and T2 to compensate for the IF selectivity of the receiver. Set receiver at about 3MC; set test oscillator to same frequency and tune the signal to the center of the screen using the regular receiver tuning control. Then with the test oscillator put the signal at one edge of the screen. Note amplitude as compared to that of the center position and adjust IF trimmers. It will be necessary to compromise between these adjustments.

The frequency modulated oscillator in the unit provides an excellent means for final alignment of the 100KC amplifier. Tune in a test signal to the center of the screen and adjust the trimmers in T3 and T4 to give the sharpest and most symmetrical pattern. The signal on the screen is actually a trace of the selectivity curve of the 100KC amplifier and corresponds exactly to the similar type of trace obtained when aligning an ordinary superhet with the aid of a frequency modulated test oscillator and oscilloscope.

If an oscilloscope with a low frequency sweep is already available it should readily be possible to modify it slightly to make it usable for panoramic reception with an RF--IF unit, thus obviating the necessity for constructing part of the complete circuit. The chief requirement would be to be able to take out a little of the sweep voltage and apply it to the reactance modulator grid, and to provide a straight-through (DC) path to the vertical plates of the scope.

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INDICATING VERY HIGH FREQUENCIES

A common requirement in testing centrimetre-wave transmission gear is to know when the current reaches a definite amplitude. For this purpose it is proposed to make use of the fact that a flash light filament of sufficiently fine gauge, to ensure a uniform distribution of current over its cross sectional area always begins to glow at a critical current amplitude.

In practice a small glow lamp with a straight filament of 0.0004 in diameter is bridged across a current loop in the tuned Lecher wire circuit of a centimetre wave generator and the point at which it first incandesces is observed through a viewing tube which is inserted through a small hole in a metal screen surrounding the generator.

D.F. DEVELOPMENTS.

For a number of years D.F. Equipment using the directional loop has been used to enable aircraft pilots to determine their positions under conditions of poor visibility. This method, although fairly satisfactory, caused some delay while taking readings.

An apparatus has recently been developed which will determine an aircraft's direction instantly and automatically. It is an Azimuth-indicating radio receiver, which gives visual indication of the direction of the source of any radio waves to which the receiver is tuned.

The antenna system consists of four vertical dipoles located at the corners of a square with a fifth dipole at the centre. The four corner antennae are used for determining direction. The centre antenna serves as a reference of radio frequency phase; to permit differentiation between directions 180 degrees apart. This form of antenna responds only to the vertical component of the electric field, since the horizontal component is cancelled out.

Each pair of directional dipoles is connected to the input of a pair of modulators, which are also supplied with an audio modulating frequency. The carrier and modulating frequency are both suppressed; only the side-bands remain. The outputs of the directional modulators, together with the output of the centre antenna, are then combined and passed to the radio receiver. The three components are separated at the output of the receiver and the signal is fed to a loudspeaker, and the two directional components to the plates of a cathode-ray tube which has two pairs of deflecting plates at right angles to each other. The rectified output of one pair of dipoles tends to deflect the spot along the line of one pair of plates, and the output of the other pair of dipoles along the line of the other pair of plates. The indication on the screen will then be a straight line whose direction depends on the relative strength of directional signals applied to the deflecting plates. If there were only two directional side-bands at the detector input in the radio receiver there would be uncertainty between directions 180 degrees apart. The output of the centre antenna, however, which is present with the two directional side-bands, serves as a reference of sign, with the result that the bearing is correctly indicated at all times during the flight.

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HELP WIN THE WARBUY WAR BONDS AND WAR SAVINGS
CERTIFICATES.

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- 9 -
SLOUCH HATS AND FORAGE CAPS.

By VK2YC.

VK2CX (Evans) now a Pilot Officer in the R.A.A.F. writing from a Victorian station requests news and location of his pal VK2 ACG and through this column also sends his regards to Charlie Miller VK2ADE.

Joe Ackerman VK2ALG, dipping his pen into Darwin ink of Army origin mentions that nothing ever happens up that way (much). He also mentions that VK3RM also ornaments the scenery around that region and that VK3RM is to be congratulated on the advent of a third pip. Joe who by the way is a two-pipper expresses pleasure at the meeting of several W hams who happened along and makes mention of a long ragchew over a bottle of corn liquor, into the wee small hours of the morning. Great dx was undoubtedly worked that night.

Frank Hanham, VK3BJ, a Sergeant in the signals side of the Army and located in N.S.W. was seen recently in Sydney. Previous to the third Sunday in November, Frank was his usual fat jolly self, but on that day met up with one VK3RJ who has again returned to the mother state. On that fateful day Jonah inveigled the trusting VK3BJ into a hiking tour over 16 miles of the Hawkesbury Rivers' rough contours. A good day was had by all, including the flies and skeeters.

QRR QRR VK2PF de VK2YC--vide September QST Page 52.
Please Captain wouldn't you relent? Yes, all enquiries to VK2YC.
Hi!- only send me some news at the same time.

A photo of little Miss 30F shows she may look like the OM. I nearly put "poor kid." ahem! Frank is still training them down at Depot and in between times finds time for a few jobs around his new home at Hampton, Vic.

Alan Furze of VK2HF was last reported amongst those "heading north."

Talking of swimming, Cec Horne VK2AIK says that they have a daily dip off his tropical isle and 2TI wasn't kidding when he said "they post a guard and mount machine guns to keep away the sharks." Of well, Cec said it anyway.

Arthur Evans, 3VQ is doing stalwart work for the R.A.A.F. up Brisbane way and reports all OK..F/O Frank Goyen in an endeavour to get closer to "Big Charlie" managed to get a posting from Ultimo to Richmond. Nice goin' Frank.

News has come from Peter Vesper 2PV. Peter is up with the mossies and the Japs, dispensing No. 9's. They say they are

bigger and better these days.

Sel Weston, VK2AJH now a P/O in the R.A.A.F. is back enjoying the climate of his home state and city and drags the portable rx around with him. He has a wife too.

What do you know...for the very first time somebody rang up with some news for this column, so you see one person reads it besides the Mag. Committee. You see we had De-moted somebody. Apologies VK3dc...you see we made him a mere 'loot when he is a Lieut-Colonel this many a month. Anyway its fb to know hams reach this exalted height in the Army, too. We do pretty well in the Air Force, I wonder how high we go in the "silent service."

Cec Light 2QM was last seen on leave in Sydney with a list to one side, but closer inspection showed it was only the pair of wings he wears on one side these days. Hope the Commission follows soon, Cec om. 2 QM had a Pilot's Licence before the war and is one of the very few lucky ones to wrangle a way out of the N.S.W. Police into one of the services.

Jack Lumsdaine 2ABQ who was also in the Police over here is now a Yeoman of Sigs in the R.A.N. Jack has seen a good bit of service. Among other places he was in Singapore when the Japs arrived there. After the "Show" he will have some tales to tell.

Now don't forget the address...78 Maloney St., Mascot. N.S.W. Phone MU1092...or to Ray Jones 3RJ R.A.A.F. Pt. Piper.

73 and thanks for them all...2YC

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EMERGENCY COMMUNICATION NETWORK

During the last month considerable progress has been made with the installation of stations at the outlying locations and quite a few of these stations have been testing with Central Control. These tests usually take place at week-ends.

The aerial for the medium frequency transmitter has been erected and is quite a landmark at its location and a great source of pride to the hams that are interested. The medium frequency transmitter has been delivered but as yet has not been tested. This transmitter with its aerial power of 200 watts is quite a fine job and sufficient to bring joy to the heart of any ham no matter how hard boiled he may be.

Once all stations are installed and beams adjusted exercises will be held under conditions approximating those that one could expect during a raid. Of course message handling will play a prominent part and VK hams will be given the opportunity of carrying out a type of transmission that they have been debarred from in the past, viz. traffic handling but more of this anon.

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

.. Federal Executive ..

Federal Headquarters has now been located in New South Wales for one year and here is a brief resume of the work carried out during this period.

EMERGENCY COMMUNICATION NETWORK. The most outstanding event in the history of Experimental Radio in Australia to date has been the inauguration of the Emergency Communication Network in New South Wales. The VK2 Division, following upon the ban of transmissions, has been untiring in its efforts to bring under the notice of the Department the value of the Australian Experimenter and his equipment. Undeterred by rebuffs this Division kept at its task and on 14th July 1942 its efforts were crowned with success and the E.C.N. is in full swing in N.S.W. Federal Headquarters took no part in these negotiations but as a result of the VK2 Division making all details available from time to time, it was possible to pass the information on to other States and as a result the South Australian Division has been successful in obtaining permission for a Network in that State.

CENSUS OF COMMONWEALTH EXPERIMENTERS. One of the first decisions made by the Executive upon assuming office in NEW SOUTH Wales was to make a Census of Australian Experimenters in an endeavor to ascertain the part being played by the Amateur in the national emergency. This survey was an unqualified success from many angles. Firstly, the number of cards returned exceeded 50% of the total cards sent on. In all 1823 cards were despatched and to date 923 cards have been returned and even at this stage, nearly twelve months after, they are still trickling in. Secondly, it brought under the notice of VK hams that the Institute was still functioning and as a result many new members were obtained by each active Division.

INACTIVE DIVISIONS. After making a survey of the position of the Institute in each State it was found that in VK5 and VK7 activities were practically nil. Of course it was fully realised that the smaller States would have some difficulty in carrying on, due to Service calls etc. It was found that Amateurs in these States were still interested in the Institute, but it was impossible to obtain continuity of Office-Bearers. Federal Headquarters discussed this position at some length and eventually it was decided that should any Division request it the Federal Executive would enrol the Members of that Division in a body to be known as the Wireless Institute of Australia. Both VK5 and VK7 made this request but since permission has been granted for the formation of an Emergency Communication Network in South Australia, this State feels that with the reawakened interest, it will be able to manage its own affairs. The Federal Executive appreciates the efforts of "Dee" Barbior 5MD and Peter Allan 7PA to keep alive the Institute in the States concerned.

"AMATEUR RADIO" - during the year negotiations were entered into with the Victorian Division publishers of "Amateur Radio" and the New South Wales Division publishers of the "Monthly Bulletin" with a view of amalgamating the two publications in an endeavor to obtain a magazine worthy of the oldest Amateur Radio organisation in the world. Eventually a basis satisfactory to both States was reached and the combined publication has been acclaimed everywhere.

PRISONER'S OF WAR FUND. During recent months a W.I.A. Prisoners of War Fund was inaugurated and to date the sum of £22/17/- has been collected; and it is believed that further sums are held by Divisions.

CUSTODY OF EXPERIMENTER'S CONTAINERS. During September an instruction was issued by the Department of Security stating that sealed containers at that time in possession of Licensed Experimenters were to be handed over to the Wireless Branch for custody during the war period. Federal Headquarters, whilst agreeing with the principle of this instruction on the grounds that if the equipment were no longer in the possession of the Experimenter, no person could by innuendo suggest that it would be used for Fifth column activities as it had been inferred in the past, nevertheless was of the opinion that any Experimenter desiring to repack his container should be given the opportunity of doing so and that an extension of time be granted for lodgement and that the Wireless Branch should make arrangements for the transport of heavy containers. These requests were made to the Chief Radio Inspector and were granted, and your Executive take this opportunity of thanking both the Chief Radio Inspector and the Senior Radio Inspectors in each State for the co-operation given.

LICENSING OF RADIO SERVICEMEN. Certain proposals for the Licensing of Radio Servicemen were recently brought under the notice of the Federal Executive, and although the necessity for the conservation of Manpower is fully realised it was felt that if these proposals were to be adopted in their entirety by the Department of War Organisation of Industry a grave injustice would be done to quite a large number of Experimenters carrying out part time Service work. Briefly the proposals were as follows:- All Radio Servicemen were to be Licensed and each Serviceman allotted a definite area and in that area no other person would be permitted to carry out Radio Service work. That only Licensed Servicemen would be permitted to purchase spare parts. That the only persons who would be admitted to obtain a License would be members of a certain trade organisation. The injustices of these proposals insofar as the Experimenter is concerned are quite obvious, and it was decided to write the Minister for War Organisation of Industry, pointing out the weaknesses of the scheme with a request that the proposals be modified to include Licensed Experimenters. A reply has been received stating that the points raised will receive careful consideration before any decisions are made.

NEW SOUTH WALES DIVISION

November General Meeting of the Division was held at Y.M.C.A. Buildings on Thursday 18th and the attendance was a very representative one.

The Chairman in declaring the meeting open extended a welcome to Sergeants L. McIntyre VK3XF, and W.P. Burford VK5PE. Also present Pat Kelly and John Thorley VK4RT. The last two mentioned hams at different times occupied the position of Secretary to the VK4 Division.

The report on the activities of the Federal Executive during its first twelve months of office (appearing elsewhere in this issue) was read and unanimously adopted, and the Executive was congratulated upon its fine work during this period.

Donations are still being received towards the Institute's Prisoner's of War Fund and at present the total stands at £13/16/- and it is anticipated that the sum of £15 will be handed over to Federal Headquarters at the end of the Divisional Year, 31st December 1942. It is anticipated that the names of P's O.W. held by the Japanese will be released very soon, and every Member of the Institute is asked to make a perusal of these lists, and if you notice the name of any ham please notify the Divisional Secretary so that he in turn can notify Federal Headquarters, who will arrange for comforts to be sent these hams.

The question of post war activities and the steps to be taken to ensure that the splendid part that is being played by the Australian Experimenter both on Service and in essential industries, shall be brought under the notice of the authorities when the time comes for the removal of the ban on transmissions, the lifting of the suspension of Experimenters Licences and frequency allocations was discussed at some length and it was decided that Federal Headquarters be requested to write both the A.R.R.L. and R.S.G.B. in an endeavor to ascertain the steps taken in America and England.

At the conclusion of general business a very interesting Lecture was delivered by Mr. Norm Hannaford on "Ultra Short Waves." This talk, although of an informal nature, proved to be one of the most educational lectures that have been given for some time and upon conclusion Norm was accorded a very hearty vote of thanks.

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SILENT KEY: Another oldtimer who has gone to meet the Great Brasspounder is Jim Wood VK2ZM of Grafton, New South Wales. Jim was just over 42 years of age and died suddenly on 14th November last. Well known for his quite and unassuming disposition Jim will be missed by a host of friends in all walks of life.

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VICTORIAN DIVISION

The December meeting of the Victorian Division again saw some interstate visitors in the persons of Allan Feitz VK2QE Roger Torrington VK2TJ. Col McDowell and Syd McLean. Three of whom are sergeants in the R.A.A.F.

Doug Norman VK3UC another member of the R.A.A.F. who has just returned from Australia's near north entertained the gathering with a talk of his experiences when the "Sons of Nippon" landed at Salamaua. He and a few other members of the R.A.A.F. (three of which were Hams) were posted there to keep the radio communications intact and to give DF bearings. His description of the first raid were vivid, and their haste to destroy the gear when the Japs landed were very interesting. Doug by the way was lost in the bush for a day without any food. After being six months or more attached to the army in the bush, he eventually arrived back in civilisation with malaria and sundry other complaints.

This divisions Prisoners of War Fund now stands at £8/19/6. £1/6/- was collected at the December meeting, and during the month a person who does not wish his name to be published, donated £5. This, with what has been collected, makes up the £8/19/6. Any further contributions will be gratefully received by the Treasurer.

Definite news is now to hand of Snow Campbell 3MR. One of our members has recently received a letter from him. Snow is in a camp in Northern Italy (a bad spot to be in at the moment by all accounts) and to put it as it was passed on "full of beans". We hope to publish this letter in the next issue.

The morse code class manager Mr. H. N. Stevens 3JO announces that he is closing the classes over the Christmas holidays, from December 18th to the first Monday in January.

The members of the Magazine Committee are eagerly awaiting the results of a crop of potatoes planted by Mr. Bert Burdekin in accordance with the ruling of the stars. Bert informed us that he had happened to listen to "one of the leading astrologers" on the radio, and learning that the next day was absolutely the best day of the year for planting, he went out into the garden and picked the worst place he had and planted potatoes. So far there is plenty of 'top'...but is there anything underneath??

The next meeting of the division will be held in the rooms, 191 Queen Street, Melbourne, on Tuesday 5th January, when interstate visitors will be very welcome. It is hoped that a member of the R.A.A.F. who has seen active service will be able to get along and give a talk.

What has happened to the gang at L.H.Q????

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

H A M S !

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