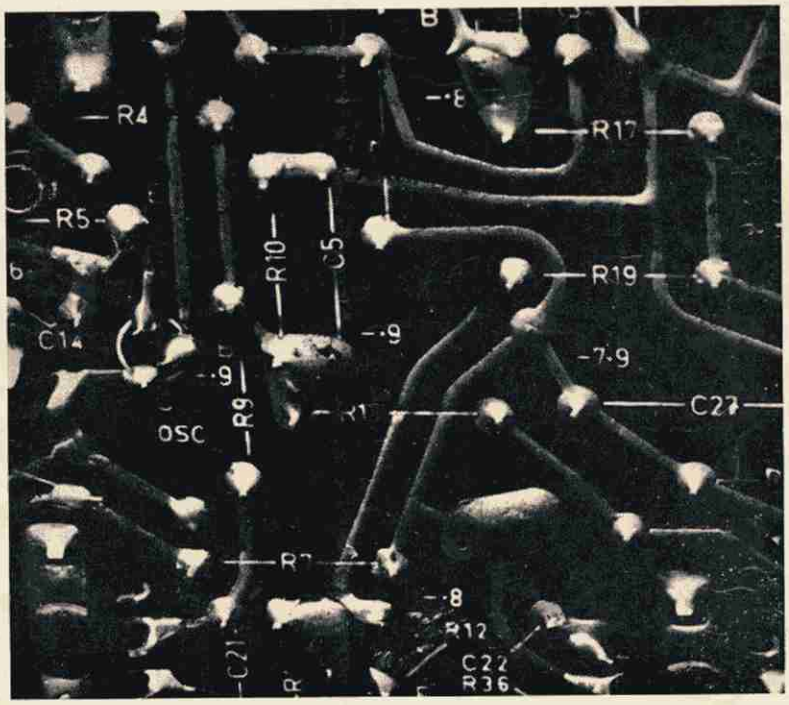
AMATEUR RADIO

JANUARY 1964



Vol. 32 No. 1

24

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TECH MULTIMETER

300 μA. movement. AC and DC voltages: 0-10, 0-50, 0-250, 0-500, 0-1000v. Current ranges (mA.) 0-1, 0-100, 0-500 mA. Ohms range: 0-100,000 ohms. Size: 3¾ x 2½ x 1¼ inches. Complete with leads.

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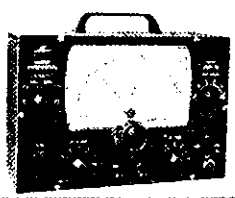

Freq. range (six bands): 120 Kc. to 130 Mc. on fundamentals; 120 to 390 Mc. on harmonics. Mod. freq. 400 and 1,000 c.p.s. Tubes: 12BH7, 6AR5. Rectifier: half wave selenium. Provision for crystal oscillator (xtal not supplied). 1 to 15 Mc. 100, 117 or 230v. a.c. input, 50/60 c.p.s. Size: 7½ x 10¾ x 4½ in. Weight: 6 lb.

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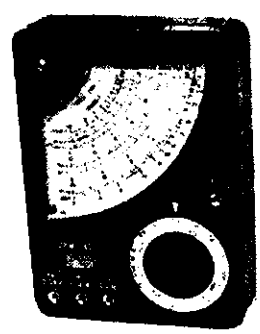

Specifications:
D.c. volts: 0-5, 25, 50, 250, 500, 2,500. A.c. volts: 0-10, 50, 100, 500, 1,000. D.c. current: 0-50 μA.; 25, 250 mA. Resistance: 0-60K ohms; 0-6 meg. Capacity: 0.01-0.3 μF. (at a.c. 5v.); 0.0001 - 0.01 μF. (at a.c. 250v.). Decibel: minus 20 db. plus 22 db. Output range 0-10, 50, 100, 500, and 1,000. Battery used: UM3 1.5v. 1 piece. Dimensions: 3¼ x 4½ x 1-1/8 in.

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OUR COVER

An enlarged portion of a printed circuit provides a modern style type of painting for our January edition. (Incidentally, all 1964 covers will be a red colour to differentiate between the 1963 (green) issues of "A.R.")

FEDERAL COMMENT

★

The commencement of another year is the usual time chosen for looking to the future and injecting new ideas into an organisation such as ours. This year of 1964 promises to be no exception to the rule. However, a few comments of the previous Editorial are in order for it had not been confirmed at that time what the final results of the Extraordinary Conference yielded. We are happy to confirm that the final Plenary meetings of the Conference, dealing with frequency extensions for the Space Services, preserved the status quo for the Amateur.

In Region 3, in which our particular interest lies, the Amateur band 144-148 Mc. is exclusively Amateur, and in addition a footnote has been added to the effect that Amateurs may use artificial satellites for communication purposes in this part of the band between 144-146 Mc. Our delegate to the Conference, Mr. Tinkler, has now returned to Australia and submitted a verbal report to Executive on his trip. A written report will be published in this journal in the near future.

It is quite obvious from this report that the Amateurs would not have fared as well as they did had it not been for the preliminary work and exhausting discussions carried out by Amateurs with their administrations prior to and during the Conference. One most important point arising from this Conference appears to be the general feeling that future Conferences will follow the lines of this one, in that it seems unlikely that a full scale Conference such as the 1959 I.T.U. will continue in the future. They are more likely to take the form of Conferences dealing with particular Services such as the International Civil Aviation Organisation or Shipping.

This will mean shorter Conferences at more regular intervals because it has been recognised that a period of four to five months at a Conference is too long and too wearing on the nerves of the delegates. For this reason, the foresight of Federal Council in deciding to immediately start collecting funds was most timely. Some members have questioned the reasons for requiring so much money to be raised by Divisions. It is the opinion of Federal Council that a Fund must be set up in order to have representation as and when required. We may not be so fortunate in the future as we have been in the past with our delegates who have had the backing of their companies in regard to salaries and expenses.

The Amateur has now grown in stature in international affairs, but in such growth must assume the responsibilities that it entails. He must now consider himself an important part of an international brotherhood which must be financially supported. It is certain that this subject will receive a great deal of attention at the next Convention, but it appears at this stage that an annual allotment from the membership subscription should be set aside in a fund for the Amateur Service. Call this a fighting fund if you wish, to protect our hobby, but despite its name, it should be raised in the interests of the Amateur Service as a whole. This in turn will mean greater co-operation between I.A.R.U. Societies, continual liaison to appreciate one another's problems and a greater sense of responsibility. This is the message then for the New Year—Let us all assume our proper responsibilities as members of the Amateur Service for a prosperous New Year.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

A SINGLE SIDEBAND SYSTEM FOR 144 Mc.

I. F. BERWICK, VK3ALZ*

IT has long appeared to the writer that the ideal band on which to demonstrate the superiority of sideband for weak signal work is 144 Mc. Although it may take a little time for receivers to improve to the stage where the full 9 db. gain is realisable, it is hoped that the device presented here will pave the way towards that goal.

Despite the imposing title, this is a comparatively elementary device consisting of three parts—

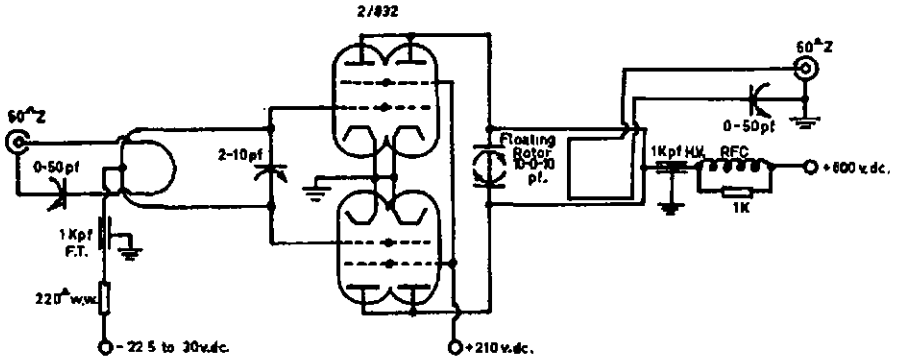
1. A transmitting up converter.
2. An AB1 driver stage.
3. A linear amplifier.

The design of such a converter calls for a little consideration. The problems are:—

(a) Linearity of the s.b. amplifiers.
(b) Spurious responses.
(c) Stability of the oscillator.
(d) Efficiency of mixer and amplifiers—an important consideration at 144 Mc.

It will be convenient to consider (a) and (d) in conjunction.

It transpires that some tube types which are highly suitable for mixer and amplifier service at h.f. on the grounds of linearity, are hopelessly inefficient at v.h.f.



Linear Amplifier.
1KPF F.T. = 1,000 pF. feed through capacitor.

Clearly there is little reward in restricting the s.s.b. generator to a single band transmitter. One normally spends considerable time, not to mention expense, in developing an acceptable s.s.b. signal in the s.b. generator. It is highly desirable to use this acceptable signal on each band one normally operates. Hence the concept of the transmitting converter.

* 107 Loongana Avenue, Glenroy, Vic.

It is convenient, therefore, to investigate the linearity of tube types known to be efficient at 144 Mc.

It appears that certain deflection amplifiers have the desirable characteristics. Of these, the 12BY7 is probably the best. This tube is used extensively in commercial converters. I did not have this type available, but found the 6CK6 to be satisfactory. Of the other types used, the 5763 is satisfactory in Class A or AB1.

The QE04/10 is a single ended beam tetrode on a B9G base and appears to be capable of good linearity and efficiency at 144 Mc.

SPURIOUS RESPONSES

Any given frequency, f_z, can be generated by mixing any other pair of frequencies, f_x and f_y, according to the formula:—

$$Z = X \pm Y.$$

However, certain combinations of X and Y will simplify the problem of suppression of the spurious responses.

Suppose we wish to obtain 144 Mc. s.b. We have available s.b. at the following frequencies: 4 Mc., 14 Mc., 50 Mc. Which frequency to choose?

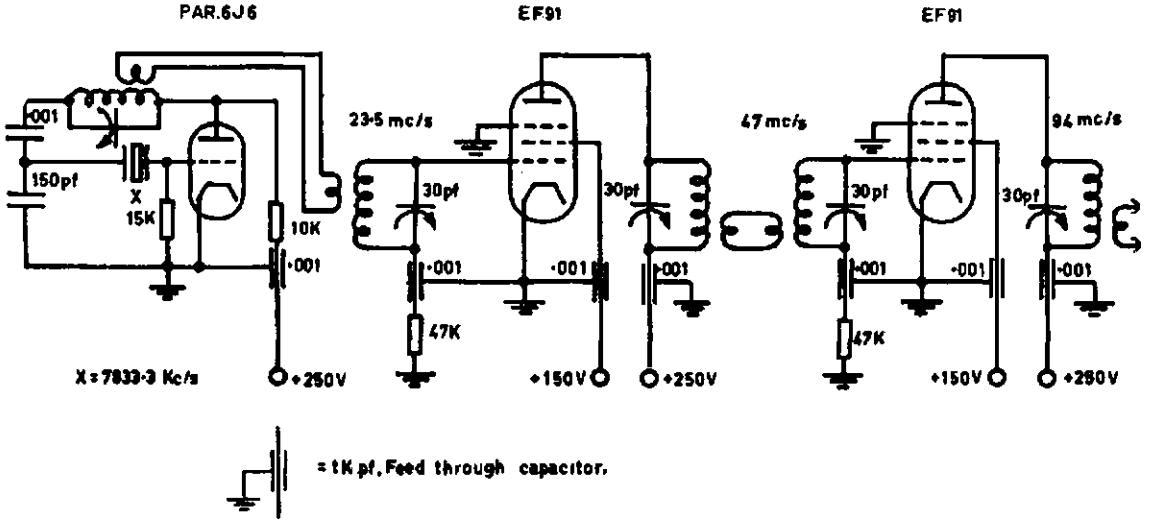
We have—

(a) 140 + 4 = 144
140 — 4 = 136
(b) 148 — 4 = 144
148 + 4 = 152
(c) 130 + 14 = 144
130 — 14 = 116
(d) 158 — 14 = 144
158 + 14 = 172
(e) 94 + 50 = 144
94 — 50 = 44
(f) 194 — 50 = 144
194 + 50 = 244

Clearly—

(a) and (b) are both unsatisfactory.
(c) and (d) are both reasonably satfactory.
(c) is a quite popular scheme.
(e) is highly satisfactory and is the scheme I have adopted.

(Continued on opposite page)



Transmitting Converter, 50 Mc. to 144 Mc.

Circuit continued on opposite page.

1KPF = 1,000 pF. feed through capacitor.

In this discussion it is assumed that both s.b. signal and the injection signal are free from spuriouses. The matter of spuriouses in the 50 Mc. transmitter was discussed in my previous article. An examination of the converter circuit will reveal that extensive measures have been adopted to eliminate spuriouses from the injection chain.

STABILITY OF THE OSCILLATOR

This is determined from the equation $x = 30 - \alpha$, where x c.p.s. is the required stability of the injection chain oscillator, and α c.p.s. is the overall stability of the s.b. source.

Since the practical aspects of oscillator stability have been adequately covered elsewhere and should be widely known, I do not propose to pursue this matter further.

LINEAR AMPLIFIER

The choice of tubes is strictly limited at 144 Mc. I have settled for a pair of 832As—not because they are the ideal tubes to use, but because they were available and efficient, and will satisfy the power requirement. They can also be replaced at a later date by the better QQE06/40s, with very minor circuit changes. The amplifier is identical with my 50 Mc. linear except that the coils are replaced with lecher bars and the negative feedback loop is omitted.

LINEARITY CHECKS

Despite what has been previously stated in this magazine and elsewhere, it appears that newcomers to s.s.b. (particularly the v.h.f. variety) imagine that a signal can be put on the air without any form of linearity check whatsoever. Any similarity between the resulting signal and s.s.b. can only be described as a remarkable coincidence.

Linearity checks are a must! If you don't have the necessary equipment to do the job, beg, buy or build it. The procedure for linearity checks is adequately covered in the Handbooks. ●

PUSH-TO-TALK ON THE GELOSO G222TR TRANSMITTER

BILL MAGNUSSON, VK3AHT*

THIS article will be of interest to all owners of the above transmitter. When operating in nets and contests one soon realises the shortcomings of a T/R switch that has to be reached for and rotated. I suppose the ultimate would be a foot operated switch and suspended mike or straight out vox. This article deals with p.t.t. but the problems encountered would be common to all three methods.

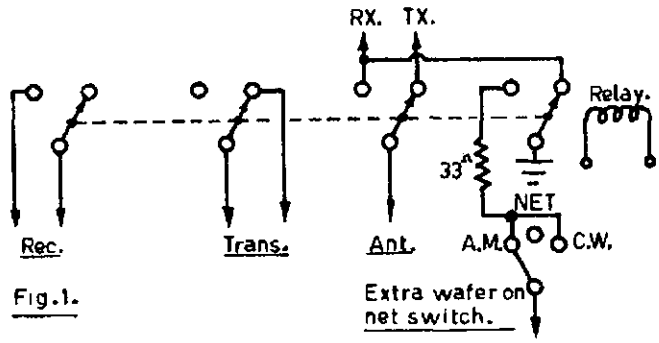


Fig. 1.

The rather complicated switching system dictates the use of some sort of relay control. A close inspection of the circuit reveals several problems, however, and discloses the reasons for some of the odd habits of this transmitter.

Most users will have noticed that when listening on your own frequency there is a tendency for the carrier to linger for some seconds after switching from transmit to receive. This is annoying and is due to the power supply not having any permanent bleeds. This has been overcome (to a degree) in the original circuit by using a wiping contact on the T/R switch which momentarily shorts a bleed resistor across the h.t. supply of the driver/sub-modulator. If this rotation is done fairly slowly the feedback and fade-away problem is eliminated, but if one is to use a relay here, circuit modifications must be made. That is unless you happen to have a relay with a wiping contact.

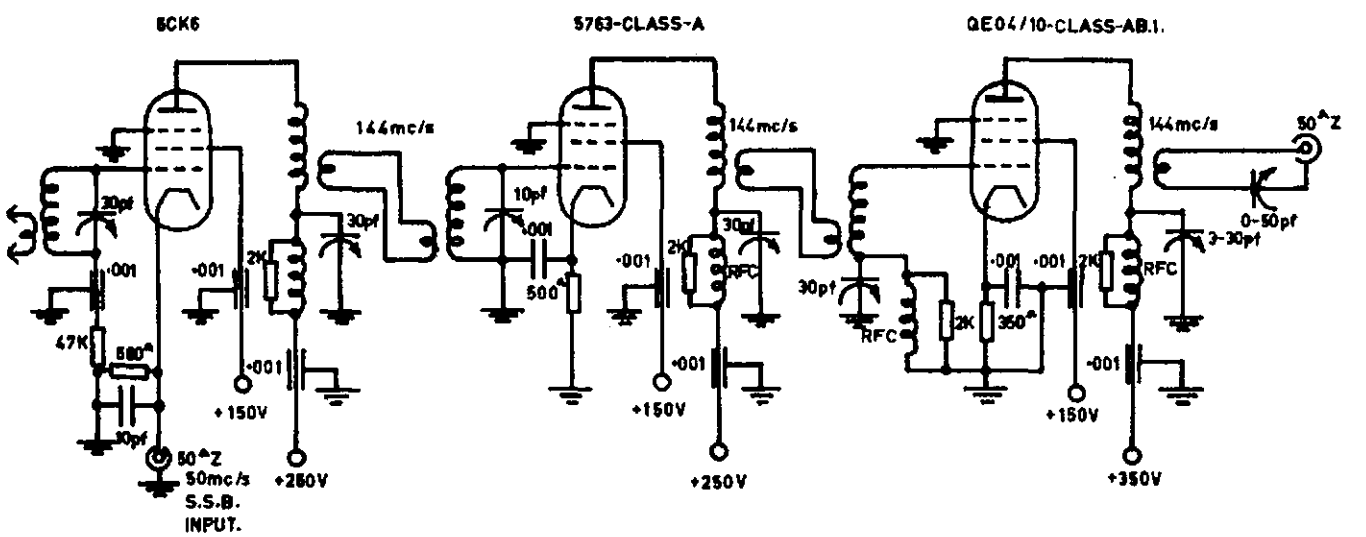
The net signal also tends to linger. This is because the net switch does not provide this bleed.

By using a four-pole double-throw relay to switch antenna and h.t., and by installing an extra wafer on the net switch, we can achieve very fast p.t.t. operation. The relay is wired as in the diagram so that section A controls the receiver, section B controls the transmitter h.t., section C controls the antenna change-over, and section D inserts the bleed resistor across the appropriate power supply.

Now due to the fact that this power supply is brought into action in the net position, provision must be made to remove this short at the same time. This is done by salvaging a switch wafer and longer shaft for the net switch. Mine came from a wrecked Geloso v.f.o. By an amount of gentle

(Continued on Page 21)

* 359 Williamstown Rd., Yarraville, Vic.



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W. H. FLETCHER, B.Sc. (G3NXT)

MEASURING instruments are an essential part of any Amateur's equipment, both to enable him to keep within the terms of his licence and to check on the effects of experimental adjustments to his equipment. Unfortunately, good meters are no longer as readily available or as cheap on the surplus market as they used to be, and the more the measuring units which can be designed to share one meter, the cheaper these instruments are to construct—the idea being, of course, to use one good meter movement for a variety of purposes.

THE S-METER

The basic unit used at G3NXT consists of a valve-voltmeter type S-meter, as shown in Fig. 1. It is housed in a sloping-front meter case measuring 6" x 6" x 5" and is on the right in the picture. Its controls are, from left to right, the g.d.o. sensitivity control, S-meter sensitivity, and meter switch, which should preferably be a good quality ceramic item. The meter used

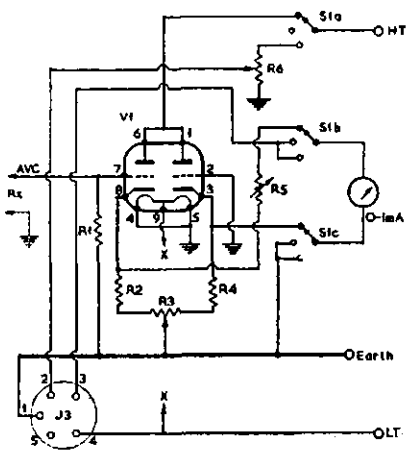


Fig. 1.—Connections for the S-Meter Circuit, applicable to any Rx with the a.v.c. drive accessible. The 0-1 mA. meter movement is separately connected to the five-way socket J3, so that it can be picked up by an externally connected g.d.o. or absorption wavemeter.

in the prototype is 3" 0-1 mA. moving-coil but any 0-1 mA. or 0-500 μA. meter with a clear scale is equally suitable.

The valve V1 is mounted on an L-shaped bracket fitted to the rear panel of the meter case by the bush of the balance potentiometer R3. The circuit is conventional, except that the sensitivity control R5 is placed in series with the meter, rather than using a potentiometer across the a.v.c. line. This arrangement protects the meter from overloading, whilst still giving a useful reading on weak signals.

The a.v.c. voltage can be derived from any convenient point on the receiver a.v.c. line. In the prototype it was picked up from one of the intersectional coupling boards in the author's R107, and fed via screened cable to the front panel socket originally intended for the operator's lamp, having first removed and taped the lamp leads. A length of screened lead, fitted with wander plugs may then be used to connect the unit to the receiver.

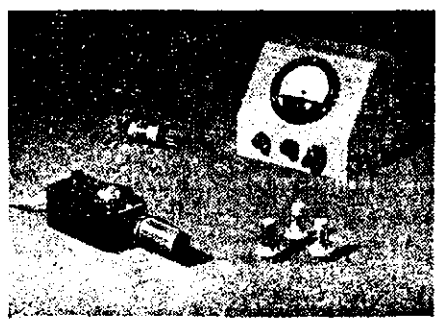
With the CR-100, a.v.c. voltage is most conveniently derived from the a.v.c. line end of the resistor (marked R1 in the CR-100 manual) which feeds the first r.f. stage; this is located in a vertical position at the rear of the r.f. compartment.

CIRCUIT ACTION

When a signal causes the receiver to develop an a.v.c. voltage, it is applied to g1 of the double triode V1. This reduces the current flowing through V1a and unbalances the bridge formed by the cathode resistors R2, 3 and 4, and the two sections of the double triode VI—causing a current to flow through the meter, which therefore gives an indication of relative signal strength.

To set up the S-meter, the meter switch S1 is set to the appropriate position and the receiver aerial terminal shorted to earth. The balance potentiometer R3 is adjusted to give a zero meter reading. Next connect an aerial to the receiver and tune in a strong local signal. The sensitivity control may be adjusted for full scale deflection (S9+). The author used his Top Band transmitter feeding a separate aerial for this adjustment. After a little experience the user will be able to interpret the deflection in terms of S-points.

Auxiliary units to make fuller use of the meter can be plugged into a five-pin Belling-Lee socket J3 mounted on the rear panel. H.t. and heater voltages are supplied as well as a direct connection to the meter. With the range switch in the centre position, the meter is connected directly to pins 1 and 3



The apparatus described by G3NXT in his article. The S-meter panel instrument is used also for the g.d.o. (left foreground), for which plug-in coils are used. The idea, basically, is to make the most of one really good panel instrument—in this case, a 3 in. 0-1 mA. moving-coil meter. The circuitry shows how this is done.

and is available for measurements, in addition to the primary purpose of providing an absorption wavemeter.

ABSORPTION WAVEMETER

The absorption wavemeter may be built into a small plastic, bakelite or paxolin box of similar dimensions to the case used for the grid oscillator.

(Continued on next page)

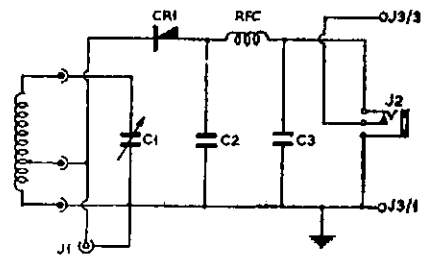


Fig. 2.—Circuit of the Absorption Wavemeter using a diode rectifier. For panel meter indication, a plug connects to socket J3 in Fig. 1.

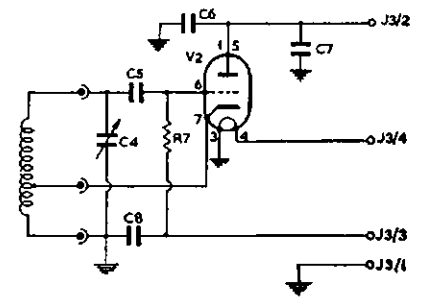


Fig. 3.—The G.d.o. circuit used by G3NXT, with a 6C4. The unit derives its power and gives a meter indication by plugging it in as marked to J3 in Fig. 1. The sensitivity control for the g.d.o. is R6 in the Fig. 1 circuit.

Table of Values

Figs. 1, 2, 3—S-Meter, G.d.o., and Absorption Wavemeter

C1, C4—50 pF. var.
C2, C3, C6, C7—0.001 μF. ceramic.
C5—100 pF. s.m.
R1—4.7 megohms.
R2, R4—500 ohms.
R3—500-ohm bal. potentiometer.
R5—10,000 ohms, S-meter sensitivity.
R6—100,000 ohms, 4w., g.d.o. sensitivity.
R7—22,000 ohms.
RFC—2.5 mH. r.f. choke.
J1—Panel mounting coax socket.
J2—Phone jack.
J3—Five-way socket (see text).
S1—3p. 3w. ceramic wafer.
CR1—OA81, or similar.
V1—12AU7, ECC82, or similar.
V2—6C4, L77, EC90.

COIL DATA

Wavemeter and G.D.O.

Freq. Range (Mc.)	Turns	Enamel Wire	Diam.	Turns per Inch	Tap at
1.7-3.4	100	30g.	1"	c.w.	25
3.3-6.7	38	30g.	1"	c.w.	12
6.2-12	38	30g.	½"	c.w.	14
11.5-21	32	22g.	½"	c.w.	12
20-40	15	22g.	½"	16	5
38-84	4	22g.	½"	16	1½

* Reprinted from "The Short Wave Magazine," September 1963.

The same coils are used as with the g.d.o. They plug into a octal socket in the end of the box and are tuned by a 50 pF. air-spaced variable condenser mounted in the top of the box and fitted with an 180° scale; this can be directly calibrated.

The crystal diode CR1 is connected to the coil tap in order to obtain more efficient energy transfer between the high-impedance tuned circuit and the low impedance diode.

If a small aerial is plugged into J1, a standard coax socket, the unit will function as a Field Strength Indicator. And if a pair of high-impedance phones are plugged into J2, phone can be monitored.

For use as an Absorption Wavemeter, the unit is held with the coil near the tuned circuit under investigation and the 50 pF. variable condenser adjusted for maximum meter reading. The coupling should be kept to the minimum necessary to obtain a sharp reading, in order to minimise pulling between the two circuits.

If the instrument range switch is in the left hand position (see Fig. 1) a Grid Dip Oscillator may be plugged into the auxiliary socket.

GRID DIP OSCILLATOR

The Grid Dip Oscillator, shown on the left of the photograph uses a 6C4 in a Hartley circuit with plug-in coils.

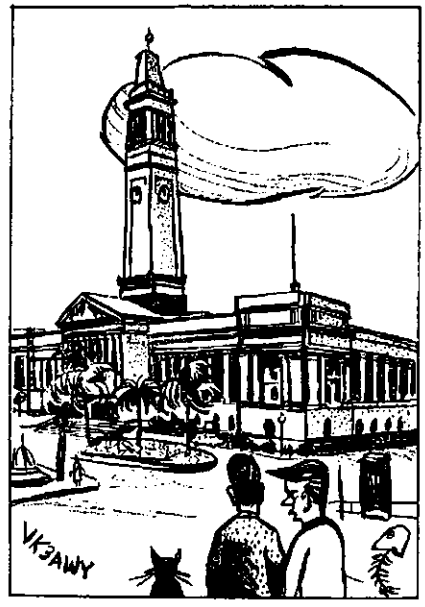
The prototype was constructed in a 4" x 1½" x 1½" ex-A.M. pressed steel-case, but an Eddystone die-cast box would be more suitable.

The valve holder for the 6C4 is on an L-shaped bracket in the centre of the case, whilst an octal valve holder is mounted in the end of the case, to take the plug-in coils. The coils are wound on Denco ½" poly. octal plug-in formers for ranges 3-6. The coils for ranges 1-2 are on short lengths of 1" diameter paxolin tube glued into octal valve bases.

The tuned circuit is completed by a 50 pF. variable condenser mounted between the coil socket and the B7G valve holder. R.f. leads should be kept as short as possible for the v.h.f. range.

The sensitivity control R6, mounted on the main unit (see Fig. 1), controls the h.t. voltage to the oscillator. Some adjustment is necessary to compensate for variation of grid current with frequency, i.e. on change of band.

The g.d.o. will check the resonance of tuned circuits by noting the frequency at which a dip occurs in the grid current when the oscillator coil is coupled to an unknown circuit. It may also be used as a signal generator for testing receivers and converters. ●



"Well it looks a darned sight better without the call sign hovering above it."

PROJECT OSCAR

This is directed to all u.h.f. groups, club leaders, s.w.l.'s and the whole Amateur fraternity. Oscar III. will, it is hoped, go up in April 1964, so be in it.

Oscar III. will be a communications satellite, and some very good DX is expected from it, particularly on the u.h.f. bands. So chaps now is the time to organise in groups and be ready to report on it, and also to contact other Hams through it. It will have a power of some two and a half watts. Remembering that Oscar I. and II. had only 300 milliwatts, some 52 reports came from Australia and the islands. The top number of loggings made by any one Ham was 51. This was made by VK1VP, of Canberra. This is the sort of a report that is appreciated.

It is hoped that all States will select their State Co-ordinator now and go to it, letting all and sundry know about Oscar III. As news comes to hand, it will appear in this magazine, on W.I.A. broadcasts, and in the various Bulletins. There will, it is hoped, be a Oscar III. network set up on 80 metres. You will have had some information in your State by now, so get cracking.

A model of Oscar will be on display in the various States soon, when we have found a way to get it around and at the same time cared for. No damage must befall this model as it has a long way to get yet.

Well chaps not too much more at this stage, see you later. May I take this opportunity to extend to all a very merry Xmas and a happy New Year.

—VK2HO, Co-ordinator.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	301	VK6KW	4	211
VK6RU	2	295	VK3WL	14	211
VK5AB	45	290	VK3ATN	28	204
VK6MK	43	284	VK4HR	12	192
VK3AHO	51	277	VK2JZ	61	190
VK4FJ	21	261	VK4RW	23	186

Amendment:
VK3TL 62 128

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	316	VK2AGH	71	252
VK3CX	26	301	VK3RP	56	239
VK4FJ	29	286	VK3ARX	68	239
VK2QL	5	279	VK3FH	15	226
VK3NC	19	268	VK3BZ	6	222
VK6RU	18	266	VK5RX	23	220

Amendments:
VK2EO 2 209 VK3TL 76 149

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	6	303	VK3BG	3	289
VK2ACX	6	309	VK3NC	77	269
VK4FJ	32	295	VK3JA	43	252
VK6MK	74	286	VK4HR	7	233
VK2AGH	63	286	VK3BZ	4	231
VK3AHO	76	280	VK3WL	45	225

Amendment:
VK3TL 66 182

MORE ABOUT CRYSTALS AND CRYSTAL FILTERS

ARIE BLES, VK2AVA*

EARLIER in 1963 I wrote some articles on FT241A low frequency crystals and high frequency filters using type FT243 crystals. In the course of several months of matching and adjusting crystals and filters, I have learned a few things worth mentioning.

FT241A TYPE CRYSTALS

If you have tried to either edge-grind them or silver-plate them for raising or lowering their frequencies, and have had the bad luck to break one or two of the suspension or contact wires, do not despair and throw that little rock away! In nine out of ten cases you can still fix your crystal to filter or oscillate, provided the little solder dots in the centre of the silver electrodes are still in position.

All you need to do is to find two thin strips of material, brass or tin-plate, to make two 1" long clips and to solder these to the crystal holder's pins. The strips must be flat and parallel, close together to hold the crystal between them, only touching the crystal at the two solder dots with a little pressure. Your crystal will be active again!

FT243 CRYSTALS

Most people do not possess the proper skill to grind these crystals for raising their frequencies. Etching with a saturated ammonium bi-fluoride solution is the easiest way. But if you need to shift the frequency more than say 100 kilocycles, you may already have a very transparent slab of crystal with extra smooth surfaces and the etching goes very slowly or stands almost still. Just heat your bi-fluoride solution to say 150 or more degrees (Fahrenheit), but do it in the open for the fluoride fumes are dangerous. The etching effect can thus be speeded up considerably.

What to do when you have gone too far in frequency? Well, if it is going to be a filter crystal, you can still lower the frequency as much as say 500 cycles by changing the pressure on the crystal electrodes in the holder, or by careful reduction of the little corners on the crystal electrodes, using a small honing stone.

If more frequency change is required it will be better to keep the crystal as an oscillator and use a different one for the filter.

* 33 Plateau Road, Springwood, N.S.W.

More shift in frequency on active oscillator rocks can be achieved by weighting the crystal surfaces. Some use cold solder for that and rub it in. Personally, I prefer to use a soft pencil and rub a little carbon on the crystal. If you have applied too much (when the crystal stops oscillating, or if the frequency has been shifted too much) just wash the crystal in soap and water and start again.

Up to 1,500 to 2,000 cycles shift can sometimes be effected. I have never noticed that the frequency of a treated crystal drifted up again with time. Someone once said that he feared the carbon might be shedded again due to vibration of the crystal!

Of course one can also lower the frequency of a crystal as an oscillator with a parallel capacity across it, but never expect more than 300 to 500 cycles shift in that manner. The crystal will stop oscillating with too much capacity across it.

HYBRID CRYSTAL FILTER CIRCUIT

The impedance of the h.f. crystal filter circuit published in Feb. and August issues of "A.R." is low and either a cathode follower input stage is recommended or some provision must be made to limit the influence of this low impedance loading on the rest of the circuit. In any case, the signal magnitude across a low impedance device is always small.

I have not seen a comment or attempt to overcome this in any magazine, and the solution given in Fig. 1 may really be a novelty.

For 5.5 to 6.0 Mc. operation, the input and output transformers can be made of ¼" diameter t.v.-type i.f. transformer forms. L1 is 45 turns, L2 is 15 turns, both close wound and only little spacing between the two coils. C is a 300/500 pF. mica compression trimmer. L1 is tuned to resonance with the former's iron slug, L2 with C, to give maximum output on the filter centre frequency.

The effect is amazing, the better impedance match between the filter and the high impedances of the input and output sides gives an extra good flat-topped filter passband and loads of signal at the grid of the following stage.

HIGHER FREQUENCY FILTERS

As I was playing with crystals for third overtone oscillator use, I started to wonder whether an active overtone crystal would perhaps also filter on or near that overtone frequency. And it does!

I have made up practical sets of filter crystals on 11 Mc., having a comparable bandwidth and shape factor as the filter sets on half that frequency. There is more work involved and much to be done on this project. Overtone crystals act differently from fundamental frequency ones and more careful adjustment is needed. But it works, and this can be a first example of such use of crystals. ●

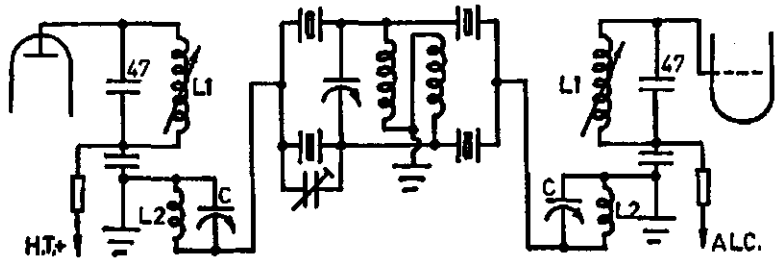
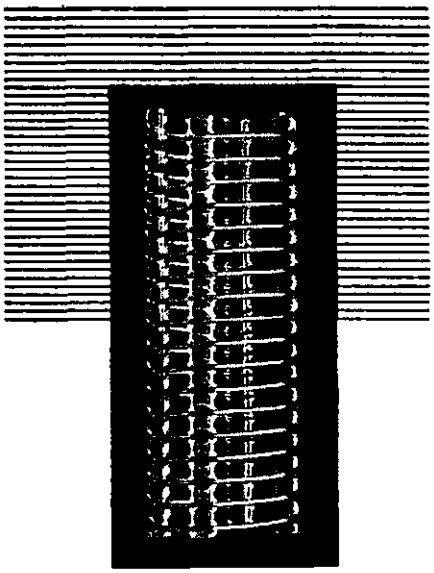


Fig. 1.



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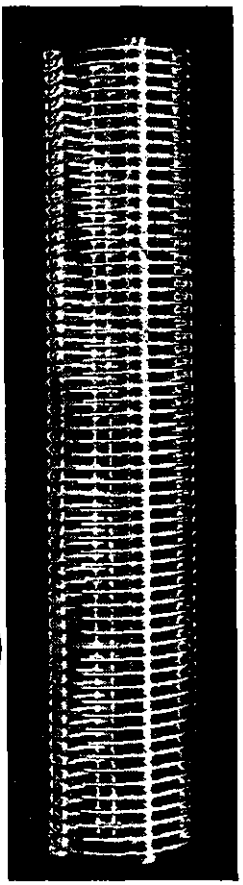

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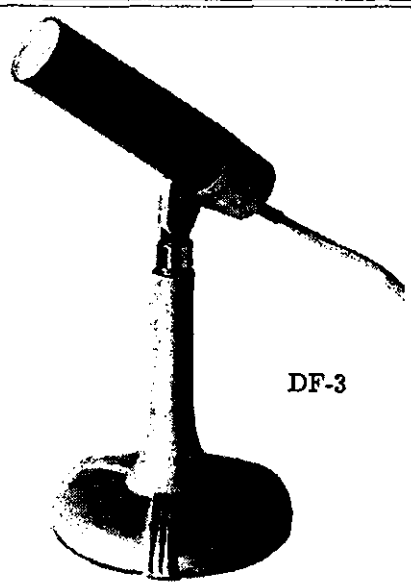

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CORRESPONDENCE:

DIVISION OF 420-450 Mc. BAND

Editor "A.R.,"

Dear Sir,

With the eminent opening of the 420-450 Mc. band to Amateurs, the incentive to undertake some of the less common modes of transmission (particularly t.v. and f.m.) will be greatly increased. To try to cope with the problem of standard frequencies and channels to fit in with possibly existing equipment, I should like to submit the following for consideration by all Amateurs.

(1) The band 420-450 Mc. is wide enough to accommodate four channels, each 7 Mc. wide, for Amateur T.v., but to leave sufficient bandwidth for guard bands and other services, and to fit in with the standard domestic t.v. receiver which would most probably be the common method of reception, only three channels are envisaged.

(2) In considering the domestic t.v. receiver (which would most probably be used as a tuneable i.f. to save modification) note must be taken that the use of the high band channels as the first i.f. would most likely add to the already difficult problem of converter noise at 420 Mc., and therefore the use of the low band is recommended. However, in the low band there are no three adjacent channels which would be the most convenient to use, but as channels 4 and 5 are adjacent, and channel 3 is spaced only 2 Mc. away, it would suggest the use of channels 3, 4 and 5 as the i.f., i.e. from 85 to 108 Mc., and this presupposes the use of a converter with local oscillator injection at 340 Mc.

Now to consider the placement of these bands within the 420-450 Mc. band. As has been seen on the majority of other v.h.f. bands, the majority of serious a.m., c.w. and s.s.b. operating is confined to the lower edges of the band, then it would seem logical to have the three t.v. channels at the top end of the band. Here though rises the problem of a guard band to reduce the possibility of out-of-band operation, and if consideration is given to the many possible d.s.b., i.e. **non vestigal sideband** transmissions which will most likely be undertaken, a minimum guard band of 2 Mc. is suggested.

This now leaves us with the following channeling:—

(1) 420-425 Mc.—a.m., s.s.b., c.w.

(2) 425-432 Mc.—a.t.v. ch. 1 (ch. 3 on t.v. rx).

(3) 432-434 Mc.

(4) 434-441 Mc.—a.t.v. ch. 2 (ch. 4 on t.v. rx).

(5) 441-448 Mc.—a.t.v. ch. 3 (ch. 5 on t.v. rx).

(6) 448-450 Mc.—guard band.

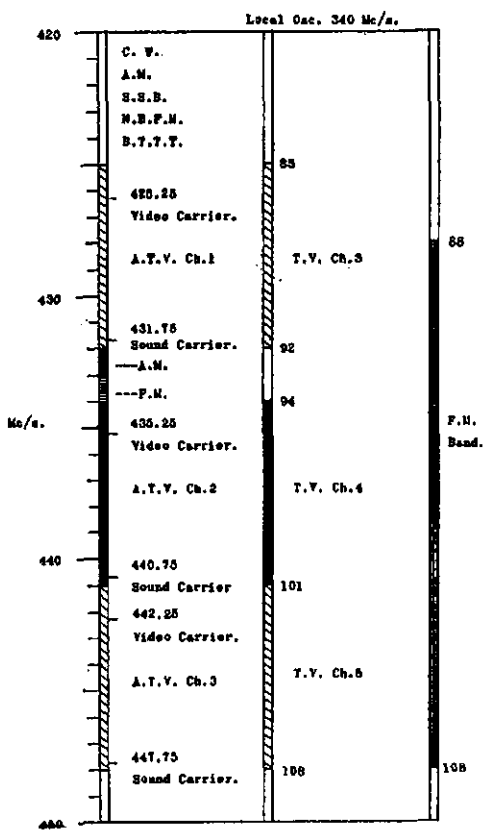
Now two further advantages immediately become obvious.

(a) Using a converter with 340 Mc. injection, the band 428-448 Mc. is converted to 88-108 Mc., i.e. the coverage of a standard f.m. v.h.f. receiver, many of which are still owned by Amateurs, and which are still available in many overseas equipments.

(b) The band 432-434 Mc. which lies between two t.v. channels is exactly three times 144.0 to 144.6 Mc., thus enabling the operators of many 2 metre transmitters to triple directly using existing transmitters and crystals. However, the first 5 Mc. has already been suggested for the more common modes, and therefore it is suggested that only 1 Mc. be available to these modes, e.g. from 432-433 Mc., the remainder from 433-434 Mc. being only for wide-band f.m. as this portion would be covered by the standard f.m. tuner.

In fact another point now arises. Many Amateurs when starting t.v. transmissions will not have the facilities for intercarrier sound, and then these two channels become eminently suitable for use as the accompanying sound channels for t.v. transmission **without** intercarrier sound. Intercarrier sound would normally be available through the standard t.v. receiver.

A further look at the Amateur t.v. position will show that many Amateurs wishing to commence video transmissions will wish to use double sideband



as being the easiest to generate. Therefore, to prevent any interference with any other services the a.t.v. ch. 3 of 441-448 Mc. could be used for double sideband, the unused or lower sideband then falling in the 434-441 Mc. of a.t.v. ch. 2 band. Therefore a.t.v. ch. 1, 425-432 Mc., should be reserved only for vestigal sideband transmissions with intercarrier sound as conforming to P.M.G. and C.C.I.R., and it is suggested that all official transmissions, e.g. W.I.A. etc., take place on this channel.

It is obvious that people wishing to do serious a.m., c.w. and s.s.b. work would build special narrow band converters to feed into their own communications receivers, but for persons wishing to experiment with t.v. the band resolves as follows:—

(1) 420-425 Mc.—a.m., s.s.b., c.w., etc. (narrow band).

(2) 425-432 Mc.—a.t.v. ch. 1, vestigal sideband, intercarrier sound, full C.C.I.R. specs. only.

(3) 432-433 Mc.—a.m., sound associated with video transmissions in a.t.v. ch. 2 and 3, non-intercarrier.

(4) 433-434 Mc.—wide band f.m., sound associated with video transmissions in a.t.v. chs. 2 and 3, non-intercarrier.

(5) 434-441 Mc.—a.t.v. ch. 2, vestigal sideband only, intercarrier f.m. sound or non-intercarrier a.m. or f.m. as in (3) and (4).

(6) 441-448 Mc.—a.t.v. ch. 3, vestigal or double sideband video, intercarrier f.m. sound or non-intercarrier a.m. or f.m. as in (3) and (4).

(7) 448-450 Mc.—guard band to prevent out-of-band t.v. signals, but may be used for other narrow band modes if so desired.

These allocations are shown diagrammatically and will assist in an understanding. It would be most opportune if all Amateurs could consider these proposals and advise their local W.I.A. Divisions so that some form of gentleman's agreement may be formulated.

Incidentally, for those interested in building wide band converters with 340 Mc. injection as suggested, quartz crystals on 37.7778 Mc. (one-ninth of 340 Mc.) are being advertised in "Wireless World" by Henry's Radio at 7/6 sterling.

—Douglas W. Rickard, VK2ZDI.

☆

PRINTED CIRCUITS FOR CARS

A British car manufacturer has announced that a new model car they will be producing will use a printed circuit wiring panel behind the dashboard. This will eliminate the familiar wiring harness with its multitude of leads.

☆

NOW REASONABLY WELL

Bill Barber, VK6DX, in a note to the Editor, sends his regards to all Amateurs and mentions that although he has not been in the best of health for the past two years, he is now reasonably well.

FOR THE BEGINNER:

A SIMPLE CONVERTER

WITH the advent of Y.R.C.'s I frequently hear demands for a simple converter. Such a converter has been described for a number of years in the A.R.R.L. Handbook. It is very inexpensive and can be used with practically any broadcast receiver, preferably those without a ferrite antenna stick system. The necessary power outlet could be fitted on a broadcast receiver under the supervision of the Y.R.C. leader and if necessary an aerial terminal.

Why is it inexpensive? The band-setting for 3.5 Mc. or 7.0 Mc. is by a two-gang capacitor about 365 pF. from any old scrapped radio. Band-tuning by 15 pF. capacitor (two for 7/9 advertised in "A.R."), one valve 6U8, one coil only (for the two bands, no switch). About a dozen resistors and condensers and, of course, the advantage that the bands are bandspread around 100° of the tuning dial.

For those who have not access to a A.R.R.L. Handbook, here is a brief description and circuit.

L1 couples aerial to L2. L2 and L3 form a bandpass circuit that can be tuned by the two gang (C1A and C1B) to 3.5 Mc. or 7.0 Mc. This bandpass circuit is coupled to the pentode section of the 6U8, acting as a mixer. In the anode circuit of the mixer is L6 and C7, tuned to 1700 kc., and L7 is coupled to the broadcast receiver.

L4, L5, C2 and C3, controlled from the panel, forms the main tuning. The oscillator tunes from 5.2 Mc. to 5.7 Mc. (Any Amateur would set this range for intending constructors.) Thus with this range the oscillator is 1700 kc. difference from the signal on 3.5-4.0 Mc. and 1700 kc. difference from 6.9 Mc. to 7.4 Mc. Thus which band appears as an i.f. of 1700 kc. will depend purely on the setting of the two-gang.

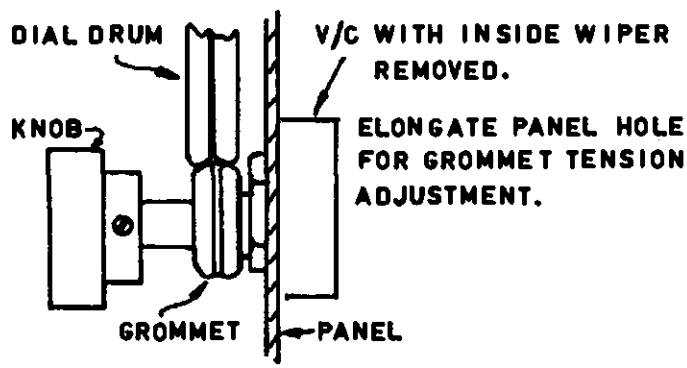
Note: The two-gang capacitor must be insulated from the chassis.

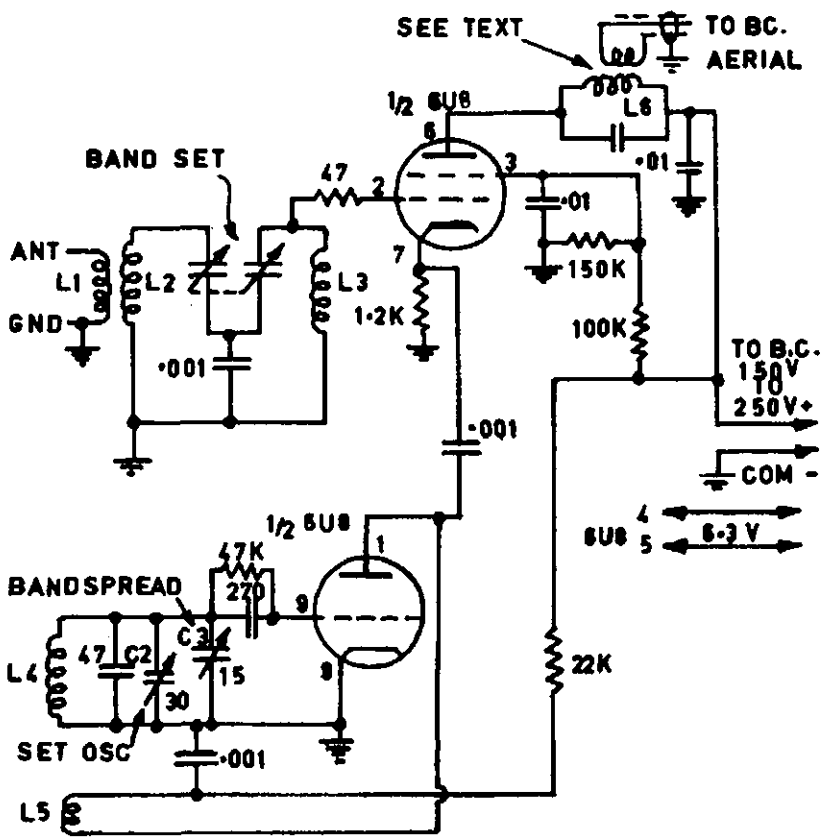
There are only two panel controls, a small knob on the two-gang termed "band set" and a slow motion device labelled "bandspread". If a slow motion dial is not available, a cord drum from a scrapped radio driven by a rubber grommet on a ¼" shaft makes an ideal replacement. A cardboard scale can be glued to the drum and an old volume control with the wiper gear cut away makes a good panel mount for the grommet spindle. A s.a.e. answers any queries or assistance to constructors.

Coil data (all coils 1" diameter):

L1—8 turns 22 s.w.g., ¼" long.
L2—19 turns 22 s.w.g., 19/32" long.
L3—Same as L2.
L4—21 turns 22 s.w.g., 21/32" long.
L5—8 turns 22 s.w.g., ¼" long.

L1 is separated from L2 by 1/32" and wound on the same former. L4 and L5 are separated by 1/32" and wound on same former.





Coils L1 and L2 should be mounted at right angles to L3.

The i.f. coils L6 and L7 can be a variety of arrangements:—

(1) 50-60 turns 28-32 s.w.g., paralleled with a 600 pF. capacitor and coupling winding of 20 turns wound on the cold end; 3/8" diameter slug tuned former.

(2) A r.f. choke of the all-wave type about 4 or 5 pies, and about 20 turns 28-32 s.w.g. wound near the cold end; no parallel capacitor with the choke.

(3) As for (2), but instead of a coupling winding, a 100 pF. condenser from the top or anode end to the b.c. set aerial terminal.

(4) The medium wave oscillator coil from a scrapped radio with a coupling winding of 20-30 turns added, or if a cathode tap of 100 pF. to b.c. set

Whichever course is adopted it must be fitted in a screened box or can, and of course to prevent b.c. break-through the whole should be in a metal box, a half size biscuit tin would make a good enclosure, or one of the aluminium or tin plate baking dishes sold in the multiple stores would do.

—A. F. W. Haddrell, VK3ZFC

(This circuit originally appeared in the A.R.R.L. Handbook.)

AUSTRALIAN DX CENTURY CLUB AWARD

OBJECTS

1.1 This Award was created in order to stimulate interest in working DX in Australia and to give successful applicants some tangible recognition of their achievements.

1.2 This Award, to be known as the "DX Century Club" Award, will be issued to any Australian Amateur who satisfies the following conditions.

1.3 A certificate of the Award will be issued to the applicants who show proof of having contacted one hundred countries, and will be endorsed as necessary, for contacts made using only one type of emission.

REQUIREMENTS

2.1 Verifications are required from one hundred different countries as shown in the Official Countries List.

2.2 The Official Countries List will be published annually in "Amateur Radio" and will be amended from time to time as required. Should a country be deleted from the Countries List at any time, members and intending members will be credited with such country if the date of contact was before such deletion.

2.3 The commencing date for the Award is 1st January 1946. All contacts made on or after this date may be included.

OPERATION

3.1 Contacts must be made in the H.F. Band (Band 7) which extends from 3 to 30 Mc., but such contacts must only be made in the authorised Amateur Bands in Band 7.

3.2 All contacts must be two-way contacts on the same band. Cross band contacts will not be allowed.

3.3 Contacts may be made using any authorised type of emission for the band concerned.

3.4 Credit may only be claimed for contacts with stations using regularly-assigned Government call signs for the country concerned.

3.5 Contacts made with ship or aircraft stations will not be allowed, but land-mobile stations may be claimed provided their specific location at the time of contact is clearly shown on the vertification.

3.6 All stations must be contacted from the same call area by the applicant, although if the call sign is subsequently changed, contacts will be allowed under the new call sign providing the applicant is still in the same call area.

3.7 All contacts must be made when operating in accordance with the Regulations laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations" or its successor.

VERIFICATIONS

4.1 It will be necessary for the applicant to produce verifications in the form of QSL cards or other written evidence showing that two-way contacts have taken place.

4.2 Each verification submitted must be exactly as received from the station contacted, and altered or forged verifications will be grounds for disqualification of the applicant.

4.3 Each verification submitted must show the date and time of contact, type of emission and frequency band used, the report and the location or address of the station at the time of contact.

4.4 A check list must accompany every application setting out the details for each claimed station in accordance with the details required in Rule 4.3.

APPLICATIONS

5.1 Applications for membership shall be addressed to the Awards Officer, Box 2611W, G.P.O., Melbourne, Vic., accompanied by the verifications and the check list with sufficient postage enclosed for their return to the applicant, registration being included if desired.

5.2 A nominal charge of 2/6, which shall also be forwarded with the application, will be made for the issue of the certificate to successful applicants who are non-members of the Wireless Institute of Australia.

5.3 Successful applicants will be listed periodically in "Amateur Radio". Members of the D.X.C.C. wishing to have their verified country totals, over and above the one hundred necessary for membership, listed will notify these totals to the Awards Officer.

5.4 In all cases of dispute, the decision of the Awards Officer and two members of the Federal Executive of the W.I.A. in the interpretation and application of these Rules shall be final and binding.

5.5 Notwithstanding anything to the contrary in these Rules, the Federal Council of the W.I.A. reserves the right to amend them when necessary.

WORKED ALL VK CALL AREAS (W.A.V.K.C.A.) AWARD

OBJECTS

1.1 This Award, to be known as the W.A.V.K.C.A. Award, is offered by the Wireless Institute of Australia as tangible evidence of the proficiency of overseas Amateurs in making contacts with the various call areas of the Commonwealth of Australia.

1.2 The Award may be claimed by any Amateur in the world who is a member of an affiliated Society of the I.A.R.U., but no Australian Amateur will be eligible.

REQUIREMENTS

2.1 A handsome Certificate will be awarded to any applicant who makes contacts with Australian Amateur Stations in the areas shown in the attached Appendix. The number of contacts required in each area is also shown.

2.2 In the case of applications prior to 1st January, 1964, a total of three (3) confirmations will suffice for call areas VK1 and VK2; thereafter one confirmation for Australian Capital Territory (VK1) will be necessary as shown in the Appendix.

OPERATION

3.1 Contacts between overseas stations and Australian stations must have been made on or after the 1st January, 1946.

3.2 Contacts may be made using any authorised frequency band or type of emission permitted to Australian Amateurs, but cross band contacts will not be allowed.

3.3 No contacts made with ship or aircraft stations in Australian territories will be eligible, but land-mobile or portable stations may be contacted provided the location at the time of contact is shown on the confirmation.

VERIFICATIONS

4.1 The applicant must submit documentary proof, in the form of QSL cards or other written evidence, confirming that two-way contacts have taken place. Such verifications must show the date and time of contact, type of emission and frequency used, signal reports and location (in the case of portable or land-mobile operation) of the stations contacted.

4.2 Verifications must be submitted exactly as received, and forged or altered evidence may result in the disqualification of the station concerned.

4.3 A list, in accordance with the details required in Rule 4.1, must be submitted with the application for the Award.

APPLICATIONS

5.1 All claims for the W.A.V.K.C.A. Award must be made by the submission of the confirmations (Rule 2.1 or 2.2), together with the list (Rule 4.3), direct to "Awards Manager," Box 2611W, G.P.O., Melbourne, Australia. Sufficient International Reply Coupons must be enclosed to cover return postage of the confirmations to the applicant.

5.2 Where a reciprocal agreement exists between the W.I.A. and the applicant's Society, the appointed officer of that Society will carry out the check, and if correct, will forward a written application for the Award on behalf of the applicant, together with the list (Rule 4.3).

5.3 Applications will be examined by the Awards Manager, who will arrange for the Award to be forwarded either direct or through the applicant's Society. The Awards Manager's decision on the application and interpretation of these Rules will be final and binding.

5.4 Notwithstanding anything in the Rules to the contrary, the Federal Council of the W.I.A. reserves the right to amend these Rules as necessary.

APPENDIX

Territory	Call Area	QSLs Required
Australian Antarctica Heard Island Macquarie Island	VK0	1
Australian Capital Territory	VK1	1
Lord Howe Island State of New South Wales	VK2	3
State of Victoria	VK3	3
State of Queensland Thursday Island Willis Island	VK4	3
State of South Australia	VK5	3
State of Western Australia	VK6	3
Flinders Island King Island State of Tasmania	VK7	3
Northern Territory	VK8	1
Admiralty Islands Bougainville Island Christmas Island Cocos Islands Nauru New Britain New Guinea New Ireland Norfolk Island Papua Territory	VK9	1

Note.—In Areas above, where more than one confirmation is required, contacts may be made with any or all of the Territories listed in brackets.

AUSTRALIAN D.X.C.C. COUNTRIES LIST

	Phone	C.W.
AC3 Sikkim		
AC4 Tibet		
AC5 Bhutan		
AP East Pakistan		
AP West Pakistan		
BV (C3) Formosa		
BY (C) China		
C9 Manchuria		
CE Chile		
CE9, KC4, LU-Z, VK0, VP8, ZL5 etc., Antarctica		
CE0A Easter I.		
CE0Z J. Fernandez Arch.		
CM, CO Cuba		
CN2 (prior 1/7/60) Tangier		
CN2, 8, 9 Morocco		
CP Bolivia		
CR4 Cape Verde Is.		
CR5 Portuguese Guinea		
CR5 Principe, Sao Thome		
CR6 Angola		
CR7 Mozambique		
CR8 (prior 1/1/62) Goa		
CR8 Port. Timor		
CR9 Macao		
CT1 Portugal		
CT2 Azores		
CT3 Madeira Is.		
CX Uruguay		
DJ, DL, DM Germany		
DU Philippine Is.		
EA Spain		
EA6 Balearic Is.		
EA8 Canary Is.		
EA9 Ifni		
EA9 Rio de Oro		
EA9 Spanish Morocco		
EA0 Spanish Guinea		
EI Rep. of Ireland		
EL Liberia		
EP, EQ Iran		
ET2 (prior 14/11/62) Eritrea		
ET2, 3 Ethiopia		
F France		
FB8 A'dam & St. Paul Is.		
FB8 Kerguelen Is.		
FC Corsica		
*FF8 French West Africa		
TU2 (fr. 7/8/60) Ivory Coast R.		
TY2 (fr. 1/8/60) Dahomey Rep.		
TZ2 (from 20/6/60) Mali Rep.		
XT2 (from 5/8/60) Voltaic Rep.		
5U7 (from 3/8/60) Niger Rep.		
5T5 (from 20/6/60) Mauritania		
6W8 (fr. 20/6/60) Senegal Rep.		
FG7 Guadeloupe		
FH8 Comoro Is.		
FI8 (pr'r 20/7/55) Fr. Indo China		

	Phone	C.W.
FK8 New Caledonia		
FL8 Fr. Somaliland		
FM7 Martinique		
FN (prior 1/11/54) French India		
FO8 Clipperton I.		
FO8 Fr. Oceania		
FP8 St. Pierre & Miq. Is.		
*FQ8 Fr. Equatorial Africa		
TL8 (fr. 13/8/60) Cen. Afric. R.		
TN8 (from 15/8/60) Congo Rep.		
TR8 (from 17/8/60) Gabon Rep.		
TT8 (from 11/8/60) Chad Rep.		
FR7 (from 25/6/60) Glorioso I.		
FR7 (from 25/6/60) Juan de Nova and Europa Is.		
FR7 Reunion I.		
FR7 Tromelin Is.		
FS7 Saint Martin		
FU8, YJ1 New Hebrides		
FW8 Wallis & Futuna Is.		
FY7 Fr. Guiana & Inini		
G England		
GC Guernsey and Deps.		
GC Jersey I.		
GD Isle of Man		
GI Northern Ireland		
GM Scotland		
GW Wales		
HA Hungary		
HB Switzerland		
HC Ecuador		
HC8 Galapagos Is.		
HE Liechtenstein		
HH Haiti		
HI Dominican Rep.		
HK Colombia		
HK0 Arch. of San Andres and Providencia		
HK0 Bajo Nuevo		
HK0 Malpelo Is.		
HL, HM, 6N5 Korea		
HP Panama		
HR Honduras		
HS Thailand		
HV Vatican		
HZ Saudi Arabia		
I1, IT1 Italy		
I1 (prior 1/4/57) Trieste		
I5 (prior 1/7/60) It. Somaliland		
IS1 Sardinia		
JA, KA Japan		
JT1 Mongolia		
JY Jordan		
JZ0 (pr'r 1/5/63) W. New Guinea		
K, W U.S.A.		
KA0, KG6I Bonin & Volcano Is.		
KB6 Baker, Howland and Am. Phoenix I. (inc. Canton I.)		

* Fr. West Africa and Fr. Equatorial Africa: Only contacts dated prior to when the particular area obtained separate listing (as shown) will count.

	Phone	C.W.
KC4 Navassa I.		
KC6 Eastern Caroline Is.		
KC6 Western Caroline Is.		
KG4 Guantanamo Bay		
KG6 Guam		
KG6 Marcus I.		
KG6 (Rota, Tinian, Saipan, etc.) Mariana Is.		
KH6 Hawaiian Is.		
KH6 Kure I.		
KJ6 Johnston I.		
KL7 Alaska		
KM6 Midway Is.		
KP4 Puerto Rico		
KP6 Palmyra Group, Jarvis I.		
KR6 Ryukyu Is.		
KS4B Serrana Bank and Roncador Cay		
KS4 Swan Is.		
KS6 American Samoa		
KV4 Virgin Is.		
KW6 Wake I.		
KX6 Marshall Is.		
KZ5 Canal Zone		
LA Bouvet I.		
LA Jan Mayen		
LA Norway		
LA Svalbard		
LU Argentina		
LX Luxembourg		
LZ Bulgaria		
MP4 Bahrein		
MP4 Qatar		
MP4 Trucial Oman		
OA Peru		
OD5 Lebanon		
OE Austria		
OH Finland		
OH0 Aland Is.		
OK Czechoslovakia		
ON4 Belgium		
OX, KG1 Greenland		
OY Faeroes		
OZ Denmark		
PA0, PI1 Netherlands		
PJ Neth. West Indies		
PJ2M Sint Maarten		
PK (from 1/5/63) Indonesia		
PK1, 2, 3 (prior 1/5/63) Java		
PK4 (prior 1/5/63) Sumatra		
PK5 (prior 1/5/63) Borneo		
PK6 (prior 1/5/63) Celebes and Molucca Is.		
PX Andorra		
PY Brazil		
PY0 Fernando de Noronha		
PY0 Trindade & Martin Vaz Is.		
PZ1 Netherlands Guiana		
SD1 (ZS7) Swaziland		
SL, SM Sweden		
SP Poland		

	Phone	C.W.
ST2 Sudan		
SU Egypt		
SV Crete		
SV Dodecanese		
SV Greece		
TA Turkey		
TF Iceland		
TG Guatemala		
TI Costa Rica		
TI9 Cocos I.		
TJ (FE8) Cameroon Rep.		
TL, TN, TR, TT (see after FQ8)		
TS (3V8) Tunisia		
TU, TY, TZ (see after FF8)		
UA1-6, UNI Eur. R.S.F.S.R.		
UA1 Franz Josef Land		
UA2 Kaliningrad Region		
UA9, 0 Asiatic R.S.F.S.R.		
UA0 (prior 1/9/60) Wrangel I.		
UB5 Ukraine		
UC2 White Russian S.S.R.		
UD6 Azerbaijan		
UF6 Georgia		
UG6 Armenia		
UH8 Turkoman		
UI8 Uzbek		
UJ8 Tadzhik		
UL7 Kazakh		
UM8 Kirghiz		
UNI (prior 1/7/60) Kar-Fin.Rep.		
UO5 Moldavia		
UP2 Lithuania		
UQ2 Latvia		
UR2 Estonia		
VE, VO Canada		
VK Australia		
VK2 Lord Howe Is.		
VK4 Willis Is.		
VK9 Christmas I.		
VK9 Cocos Is.		
VK9 Nauru I.		
VK9 Norfolk I.		
VK9 Papua Terr.		
VK9 Terr. of New Guinea		
VK0 Heard I.		
VK0 Macquarie I.		
VO (prior 1/4/49) Newf./Lab.		
VP1 British Honduras		
‡VP2 (prior 1/6/58) Leeward Is.		
VP2 Anguilla		
VP2 Antigua, Barbuda		
VP2 Br. Virgin Is.		
VP2 Montserrat		
VP2 St. Kitts, Nevis		
‡VP2 (prior 1/6/58) Windw'd Is.		
VP2 Dominica		
VP2 Grenada & Deps.		
VP2 St. Lucia		
VP2 St. Vincent & Deps.		
VP3 British Guiana		
VP4 Trinidad & Tobago		

‡ One contact with each group formerly known as "Leeward Is." and "Windward Is." dated prior to 1/6/58 may be credited, in which case no further credit as a separate listing, as from 1/6/58, will be given those particular islands.

	Phone	C.W.
VP5 .... Cayman Is.		
VP5 .... Turks & Caicos Is.		
VP6 .... Barbados		
VP7 .... Bahama Is.		
VP8 .... Falkland Is.		
VP8, LU-Z .... South Georgia		
VP8, LU-Z .... South Orkney Is.		
VP8, LU-Z .. South Sandwich Is.		
VP8, LU-Z, CE9 .... Sth. Shet. Is.		
VP9 .... Bermuda Is.		
VQ1 .... Zanzibar		
VQ2 .... Northern Rhodesia		
VQ6 (prior 1/7/60) Br. Somalil'd		
VQ8 .... .. Cargados Carajos Shs.		
VQ8 .... Chagos Is.		
VQ8 .... Mauritius		
VQ8 .... Rodriguez I.		
VQ9 .... Aldabra Is.		
VQ9 .... Seychelles		
VR1 (includ. Canton Is.) British Phoenix Is.		
VR1 .... Gilbert & Ellice Is. and Ocean I.		
VR2 .... Fiji Is.		
VR3 .... Fanning & Christmas Is.		
VR4 .... Solomon Is.		
VR5 .... Tonga Is.		
VR6 .... Pitcairn I.		
VS1 (prior 16/9/63) .. Singapore		
VS1, 9M2 (from 16/9/63) West Malaysia		
VS4, ZC5 (from 16/9/63) East Malaysia		
VS4 (prior 16/9/63) .... Sarawak		
VS5 .... Brunei		
VS6 .... Hong Kong		
VS9 .... Aden & Socotra		
VS9 .... Kamaran Is.		
VS9 .... Kuria Muria		
VS9 .... Maldive Is.		
VS9 .... Sultanate of Oman		
VU2 .... India		
VU.... .... Laccadive Is.		
VU .... Andaman & Nicobar Is.		
XE, XF .... Mexico		
XE4 .... Revilla Gigedo		
XT2 (see after FF8)		
XW8 .... Laos		
XZ2 .... Burma		
YA .... Afghanistan		
YI .... Irak		
YK .... Syria		
YN, YN0 .... Nicaragua		
YO .... Roumania		
YS .... Salvador		
YU .... Yugoslavia		
YV .... Venezuela		
YV0 .... Aves I.		
ZA .... Albania		
ZB1 .... Malta		
ZB2 .... Gibraltar		
ZC5 (pr. 16/9/63) Br. Nth. Borneo		
ZC6 .... Palestine		
....		

	Phone	C.W.
ZD3 .... Gambia		
ZD4 (prior 5/3/57) Gold Coast, Togoland		
ZD6 .... Nyasaland		
ZD7 .... St. Helena		
ZD8 .... Ascension Is.		
ZD9 .. Tristan da Cunha and Gough I.		
ZE .... Southern Rhodesia		
ZK1 .... Cook Is.		
ZK1 .... Manihiki Is.		
ZK2 .... Niue		
ZL .... Chatham Is.		
ZL .... New Zealand		
ZL1 .... Kermadec Is.		
ZL4 .. Auckland and Campbell Is.		
ZM7 .... Tokelaus		
ZP .... Paraguay		
ZS1, 2, 4, 5, 6 .... Rep. of S. Africa		
ZS2 .... Prince Ed. and Marion I.		
ZS3 .... South-West Africa		
ZS7 (see SD1)		
ZS8 .... Basutoland		
ZS9 .... Bechuanaland		
3A .... Monaco		
3W8, XV5 .... Vietnam		
4S7 .... Ceylon		
4W1 .... Yemen		
4X4 (from 14/5/48) .... Israel		
5A .... Libya		
5B4 .... Cyprus		
5H3 .... Tanganyika		
5N2 .... Nigeria		
5R8 .... (Madagascar) Malagasy		
5T5 (see after FF8)		
5U7 (see after FF8)		
5V .... Togo Rep.		
5W1 (ZM6) .... Samoa		
5X5 (VQ5) .... Uganda		
5Z4 (VQ4) .... Kenya		
6N5 (see HL)		
6O1, 6O2 (from 1/7/60) Somalia Rep.		
6W8 (see after FF8)		
6Y (VP5) .... Jamaica		
7G1 (from 1/10/58) Rp. of Guinea		
7X2 (FA) .... Algeria		
9A (MI) .... San Marino		
9G1 (from 5/3/57) .... Ghana		
9K2 .... Kuwait		
9K3 .. Kuwait-Saudi Arabia N.Z.		
9L1 (ZD1) .... Sierra Leone		
9M2 (prior 16/9/63) .... .. Malaya		
9N1 .... Nepal		
9Q5 (previously OQ5-0) Rep. of The Congo		
9S4 (prior 1/4/57) .... Saar		
9U5 (from 1/7/60 to 30/6/62) Ruanda-Urundi		
9U5 (from 1/7/62) Rwanda Rep.		
9X5 (from 1/7/62) .... Burundi		
--- .... Cambodia		
....		
....		

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST, 1964

Saturday, 8th February, to Sunday, 9th February

DATE

Saturday, 8th February, to Sunday, 9th February, 1964.

DURATION

From 1600 hours E.A.S.T., 8th February, to 1600 hours E.A.S.T., 9th February, 1964.

OBJECTS

The operators of Portable and Mobile Stations within all VK Call Areas will endeavour to contact other Portable/Mobile and Fixed Stations in Australian and Overseas Call Areas.

RULES

1. There shall be five sections in the Contest:—
   (a) Portable/Mobile Transmitting, Phone.
   (b) Portable/Mobile Transmitting, C.w.
   (c) Portable/Mobile Transmitting, Multiple Operators, Open only.
   (d) Fixed Transmitting Stations working Portable/Mobile Stations, Open only.
   (e) Reception of Portable/Mobile Stations.

2. All Australian Amateurs may take part. Mobile or Portable Stations shall be limited to an input of 25 watts to the final stage. This power shall be derived from a self-contained and fully portable source. A Portable/Mobile Station shall not be located within one mile radius from the home(s) of the operator(s), nor be situated in any occupied dwelling or building.

Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross-band operating is permitted.

3. Amateurs may enter for either (a) or (b), or both, in the Portable/Mobile sections.

4. One contact per station for phone and one for c.w. per band is permitted.

5. Entrants must operate within the terms of their licences and in particular observe the regulations with regard to portable operation.

6. Serial numbers consisting of RS or RST report plus three figures commencing with 001 and increasing by one for each successive contact shall be exchanged.

6a. Entrants in Section (c) for Multiple Operator Stations can set up separate transmitters to work on different bands at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001 and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the Operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

7. **Scoring:—**

(a) **Portable/Mobile Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .... **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .... **10 points**

For contacts with Fixed Stations outside the entrant's Call Area .... **5 points**

For contacts with Fixed Stations within the entrant's Call Area .... **2 points**

(b) **Fixed Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .... **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .... **10 points**

8. The following shall constitute Call Areas: VK1 and VK2 combined, VK3, VK4, VK5 and VK8 combined, VK6, VK7, VK9 and VK0.

9. All logs shall be set out under the following headings: Date/Time (E.A.S.T.), Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed. Contacts must be listed in numerical order.

In addition, there shall be a front sheet showing the following information:—

Name.....Address.....
Call Sign.....Section.....
Call Sign of other operator(s) (if any)....
Location of Portable/Mobile Station.....
From .....hours to .....hours
From .....hours to .....hours

A brief description of equipment used, bands used and points claimed, followed by the declaration:

"I hereby certify that I have operated in accordance with the rules and spirit of the Contest."

Signed..... Date.....

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations and the Rules of this Contest or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Committee of the Wireless Institute of Australia is final and no disputes will be entered into.

12. Certificates will be awarded to the highest scorer in each Call Area. Additional Certificates may be issued at the discretion of the F.C.C.

13. **Return of Logs:—**

All entries must be postmarked not later than the 8th March, 1964, and addressed to the—

Federal Contest Committee, W.I.A., Box 638J, G.P.O., Brisbane, Queensland.

RECEIVING SECTION

14. This section is open to all Short Wave Listeners in VK Call Areas. The Rules shall be the same as for the Transmitting Stations. Logs shall take the same form as for Transmitting Stations, but will omit the serial number received.

Logs must show the Call Sign of the Station heard, the serial number sent by it, and the Call Sign of the Station being worked.

Only one lot of points can be claimed for any one contact between two stations, for example: VK2AA/P calling VK3XX/P and exchanging numbers. Points can be claimed only for VK2AA/P working VK3XX/P. **No** points can be claimed for VK3XX/P working VK2AA/P during this particular contact.

Scoring will be on the same basis as for Transmitting Stations. It will not be sufficient to log a station calling CQ. A station may be logged once only for phone and once for c.w. in each band.

Awards.—Certificates will be awarded for the highest scorer in each Call Area.

Recent Trends in Receiver Front-End Design*

Noise Figure and Cross Modulation Characteristics of Tube and Transistor Front Ends

E. A. ANDRADE, WODAN

● Building a receiver for immunity to cross-modulation calls for compromising on other desirable features. Here is a discussion of receiver front-end design that the man who makes his own can't afford to miss.

EARLIER "QST" articles,[1, 2, 3] have painted a fairly comprehensive picture of the performance to expect of a modern high-quality communications receiver. Superheterodyne front-end performance has certainly come a long way from the days of the National FB-7 (a very advanced receiver for its day, indeed!), with its two 20 metre bands 910 Kc. apart, to the modern double-conversion crystal controlled s.s.b. receiver.

Two recent trends in receiver design, the band-passed front end and the transistor front end, will be discussed in this article. Means of minimising some of the problems will also be discussed.

Before proceeding, it might be well to review the requirements for a good communications receiver r.f. section.

SENSITIVITY

The receiver must have enough amplification to make the weakest signals audible in the loudspeaker. Such amplification is fairly easy to attain in the modern superheterodyne, where gain may be obtained at several different frequencies. The gain can be relatively low at any one of the frequencies, so gain stability is not a serious problem. The gain from antenna to loudspeaker in a typical communications receiver may be as high as 10 million.

However, all this gain will not allow the operator to copy a weak DX signal unless the signal-to-noise ratio is adequate. This means that the noise contributed by antenna coupling circuits, r.f. amplifiers and mixers must be held to a minimum.

The best way to express receiver sensitivity is either in terms of signal-to-noise ratio or—even better—in terms of noise figure.

It is generally agreed that in the h.f. spectrum (2 to 30 Mc.) a noise figure of 6 to 7 db. is all the sensitivity that can be used because of the masking effects of antenna noise, provided that a matched antenna system is used. In our discussion we will consider this sensitivity adequate. For a further discussion of noise figure, see references 1 and 2.

CROSS-MODULATION

Unfortunately, adequate gain and sensitivity are not the entire story in a communications receiver. An often neglected area of front-end design is its performance in the presence of strong signals out of the pass-band.

If we are listening to a weak DX signal with an S meter reading of, say, S2 and a strong local comes on the air, perhaps 50 Kc. removed from our DX station's frequency, the modulation of the undesired signal may appear on the weaker signal. This effect is known as cross-modulation. In the case of single-sideband signals, the splatter that you have been blaming on the other fellow's signal could be generated in your own receiver by its cross-modulation.

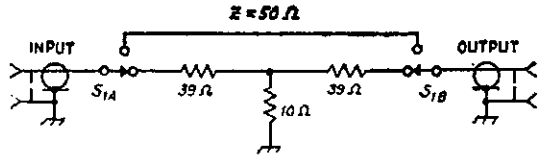


Fig. 1.—Circuit of 20 db. "T" pad for insertion in coaxial line. Values given are for 50-ohm line. Resistors are ½ watt composition. S1 is a d.p.d.t. toggle switch. Coax connectors may be any type.

Another effect, closely related to cross-modulation, is desensitication, or blocking. This occurs when a strong off-channel signal actually drives the r.f. amplifier or a mixer into grid current so the tube biases itself toward cutoff. Generally, if the cross-modulation capabilities of a receiver are adequate there is no trouble from blocking effects.

Cross-modulation performance of a receiver is usually plotted for a fixed level of desired signal in the passband against various levels of undesired signal that cause cross-modulation 10 db. below the desired signal audio level.

If you suspect that your receiver is cross-modulating, an easy check may be made by inserting a 20-db. pad between the receiver and the antenna. The desired signal is usually strong enough so that it may still be he heard. However, if the interfering signal is the result of receiver cross-modulation, it will disappear when the pad is inserted. Fig. 1 gives the circuit and values for a 20-db. pad. The pad should be shielded to prevent stray pickup, and the construction should be such as to minimise capacitive coupling between the input and output connectors.

THE BAND-PASSED FRONT END

A considerable simplification in the tuning mechanism of a multiple conversion receiver may be accomplished by replacing all signal-frequency tuned i.f. circuits with suitable broad-band transformers. usually designed just to accommodate one Ham band. The receiver band switch then selects the proper transformer for the desired band. The reduction in mechanical complexity is certainly very attractive, particularly to the home constructor. Unfortunately, a serious penalty in cross-modulation performance, and to a degree sensitivity, is incurred.

Cure D in Fig. 2 shows the cross-modulation of a typical commercial receiver having a broad-band front end, compared to one (Collins 75A-4) which uses two tuned circuits at r.f., Curve **B**. The curves were taken with a 5 μV. desired signal, both the desired and undesired signals being fed to the 50 ohm receiver input. For undesired signal levels of 0.1 to 1.0 volt, the cross-modulation occurs essentially in the r.f. amplifier tube of a tuned receiver. In a broad-banded receiver it usually occurs in the first or second mixer. Cross-modulation of undesired signal levels below 0.1 volt generally occurs in the mixer stages, in a tuned receiver, unless extremely low r.f. amplifier gain and very high antenna-coil gain are used. The noise figure of the broad-band receiver was considerably poorer than the 75A-4, as a result of a compromise in antenna-coil gain in order to minimise cross-modulation as much as possible.

The poorer performance of band-pass circuits would be most noticeable on the three lower-frequency bands, 3.5, 7 and 14 Mc. As the signal frequency is increased, the effective selectivity of

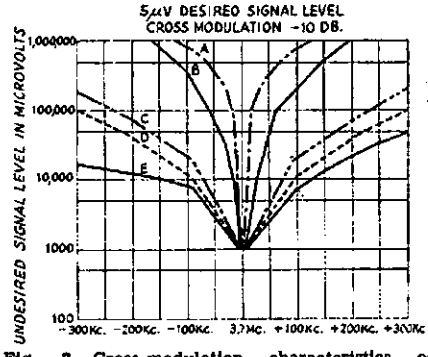


Fig. 2.—Cross-modulation characteristics of various types of receiver front ends. The curves show the undesired-signal input, as a function of frequency, required to produce cross-modulation 10 db. below the output from a 5 microvolt desired signal on 3.7 Mc.

A—Tuned r.f. amplifier using a 6386 tube.
B—Collins 75A-4.
C—Broad-band r.f. amplifier using 6386.
D—Commercial broad-band receiver.
E—Transistor front end.

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* Reprinted from "QST," June, 1962.

1. Goodman, "How Sensitive is Your Receiver?" "QST," September 1947.
2. Pappenfus, "A Discussion of Receiver Performance," "QST," January 1955.
3. Pappenfus & Andrade, "Modifying 75A-2 and 75A-3 Receivers," "QST," July 1955.

the simple r.f. tuned circuits decreases. At 30 Mc., with an operating Q of 40 in each tuned circuit, the 6-db. response points with two tuned circuits would be 1.4 Mc. apart. Thus at this frequency there is very little choice between the band-pass characteristics of the usual two-tuned-circuit r.f. amplifier and mixer, or the band-passed system.

Let's say that in spite of the problems outlined above, we've decided to build that "dream receiver" with broad-band r.f. circuits, in the interests of simplified home construction. What can we do to minimise the problems? Cross-modulation is caused by two factors: lack of selectivity, and insuffcient dynamic range in the r.f. amplifier and mixer tubes. We have sacrificed front end selectivity for broad-band r.f. circuits, but if we are able to find some tubes with a very low equivalent-noise resistance, we can use low antenna-coil and r.f.-amplifier gain. This would have the same effect as increasing the dynamic range of the tubes, thereby allowing us to handle stronger undesired signal levels than previously. While the same approach applied to a tuned receiver would provide outstanding strong-signal performance, a fairly acceptable band-pass receiver could be built.

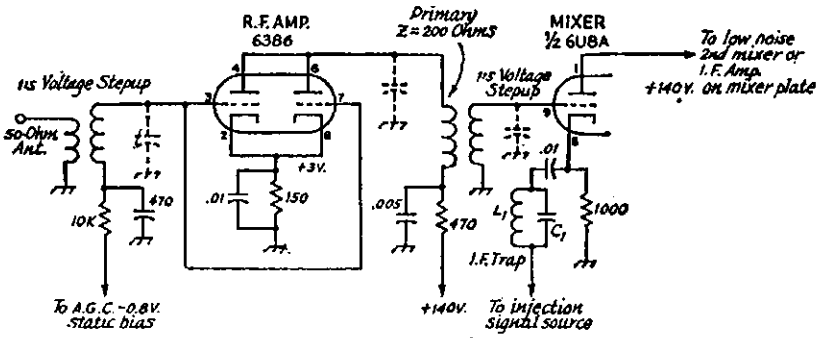


Fig. 3.—Low-noise triode r.f. amplifier-mixer circuit with good cross-modualtion characteristics. Resistors are ½ watt composition. L1C1 is a trap circuit tuned to the i.f. output frequency of the mixer. See text for adjustment of interstage transformers.

Fig. 3 shows a rough schematic of such a front end. A 6386 remote-cutoff dual triode, with both sections in parallel, was selected for the r.f. amplifier. The plate load for the 6386 is very low, about 200 ohms. This keeps the voltage gain between the grid and plate less than unity, and no neutralisation of the r.f .stage is necessary. Voltage gain to the mixer is obtained in the broad-band coupling transformer. A transformer voltage gain of 5, combined with a tube voltage gain of 0.8, provides an over-all r.f. stage gain of 4, which is adequate to overcome the mixer noise.

When setting up the transformer, adjust primary turns and coupling for a voltage gain of 0.8 from grid to plate of the 6386. Then re-check the secondary voltage to make sure there is a gain of 5 in the transformer.

The mixer is the triode half of a 6U8 or one section of a 12AT7, with cathode injection. These tubes used as mixers have an equivalent noise resistance of about 2,000 ohms, compared with 60,000 ohms in a pentagrid mixer such as a 6BA7. It is this low mixer noise resistance that allows us to use a total r.f. stage gain of only 4 and still realise a 6.5 db. over-all noise figure. To accomplish similar sensitivity with the 6BA7 as a mixer would require an r.f. stage gain of nearly 25. This would result in severe degradation of mixer cross-modulation performance because of the very high levels of undesired signal that would appear at the mixer grid.

By using no more antenna-coil gain than is necessary to provide our 6.5 db. noise figure, we keep undesired signal levels relatively low at the r.f. amplifier grid. The 6386 equivalent noise resistance under these operating conditions is 750 ohms, including the effect of first-mixer noise. An antenna-coil voltage gain of 5 will satisfy the noise-figure requirements.

The broad-band version of this front end has not been breadboarded to date. However, the tuned-version cross-modulation is shown in Fig. 2, curve A. A projected curve, C, based upon the gains and known cross-modulation levels in the tuned circuit, indicates the performance to be expected with broad-banding.

A word of caution is necessary converning the injection signal for the triode mixer. To fully realise its low noise resistance, it is quite necessary to have a low-noise injection system as well as a source impedance of 50 ohms or less. The most troublesome noise injection sources is generally the white noise occuring at intermediate frequency. In most cases a parallel-tuned i.f. trap, inserted in the lead to the mixer cathode, is sufficient to reduce this noise to an acceptable level (L1C1 in Fig. 3). If a variable i.f. is used following the first mixer, it may be necessary to substiute a high-pass filter with a cutoff frequency below the lowest injection frequency.

A simple way of checking source impedance is to connect the r.f. probe of a v.t.v.m. across the unloaded output circuit of the injection oscillator. Then try different values of resistance across the output circuit, looking for the oscillator voltage to drop to one-half its unloaded value. The resistor value that causes this to happen is equal to the source impedance of the oscillator.

★

Fig. 4.—Typical curve of noise figure vs. collector current for a 2N1742 transistor as an r.f. amplifier, at 200 Mc.

★

THE TRANSISTOR FRONT END

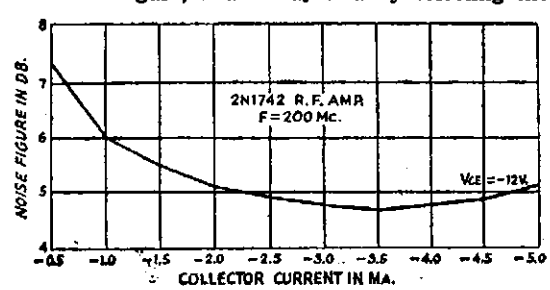
Certainly a general article on receiver design these days should include a discussion of transistorised circuitry. Unfortunately, although it is fairly easy to obtain excellent sensitivity with the newest r.f. transistors, there is a severe limitation on strong-signal performance. In fact, unless a very severe reduction in sensitivity is accepted, a transistor front end may be expected to cross-modulate with 20 to 30 db. less undesired signal than an equivalent tube receiver. A typical transistor receiver cross-modulation curve is shown in curve E, Fig. 1.

Text books tell us that there is no significant difference in the noise figure of a given transistor in any of the three amplifier configurations: common base, common emitter, and common collector. This has been pretty well confirmed in practice as well as theory.

It is now possible to attain a transistor noise figure of 4 db. as high in frequency as 200 Mc., with transistors in the three- to five-dollar class, thus making a 7-db. noise figure in the 3 to 30 Mc. range a relatively easy job. It should also be possible to design some excellent 6 and 2 metre portable equipment using these types. Some transistors that will do this job are the Philco types 2N1742, T2042, and T2028; Texas Instrument types 2N2189 and 2N2191, and the Amperex Universal type 2N2084.

In order to realise the best noise figure capabilities of an r.f. transistor, careful attention must be paid to both the recommended collector current for minimum noise figure and the recommended source impedance. The source impedance for minimum noise figure is generally near the value of the input impedance of the transistor in the **common-emitter configuration.** This value does not change significantly when the transistor is used in the other amplifier configurations. Fig. 4 shows how collector current and noise figure of the Philco 2N1742 are related.

Fig. 5 is a schematic of a typical common-emitter r.f. stage and mixer stage using the 2N1742 and 2N1743. The r.f. stage available power gain is partly a function of frequency, and varies from 45 db. at 3 Mc. to 35 db. at 30 Mc. A noise figure of 7 db. is attainable if the coll tap to the transistor is set to match the input impedance of the transistor. A collector current of 3.5 mA. corresponds to the recommended value for minimum noise figure, and is adjusted by selecting the



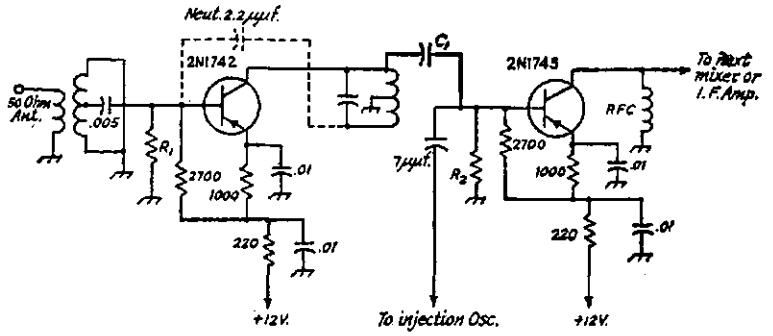


Fig. 5.—Transistor r.f. amplifier and mixer circuit. Capacitances are in μF. except as indicated; resistances are in ohms; resistors are ½ watt. See text for adjustment of antenna coil tap. Interstage coil centre-tapped.

C1—Selected for desired r.f. stage gain; typically 7 pF.
R1—Approximately 12,000 ohms; adjust for 3.5 mA. collector current.
R2—Approximately 18,000 ohms; adjust for 1.0 mA. collector current.

proper value for R1 (approximately 12,000 ohms).

Fig. 6 is a plot of input capacitance and input impedance vs. frequency, for various values of collector current, for the 2N1742. If the 2N1742 is used in the 3-30 Mc. frequency range, neutralisation will probably not be necessary. However, if it is used at higher frequencies than 30 Mc., it would be desirable to add the network shown dotted in Fig. 5, to realise the maximum power gain and minimum noise figure.

CROSS-MODULATION IN TRANSISTOR R.F. STAGES

As stated previously, cross-modulation is a serious problem in transistorised receivers. R.f. transistors have an inherently limited dynamic range and will cross-modulate with some 20 to

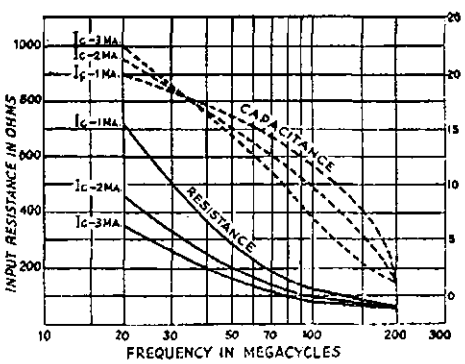


Fig. 6.—Typical equivalent parallel input resistance and capacitance, 2N1742 with Vce equals —10 volts, for selected values of collector current, output short-circuited.

30 db. less signal than a tube stage. Although to date no one has come up with a good answer to the problem, there are a few design tricks that help to minimise it.

The most simple device to minimise cross-modulation would be a 20-db. attenuator with a switch to connect it between the antenna and the receiver input stage when a strong off-channel signal is cross-modulating. Perhaps this sounds a bit agricultural, but it works, provided the desired signal is strong enough to overcome the 20-db. loss. Admittedly, this ruins the noise figure of the receiver, but there's not much point in having a 6 or 7 db. noise figure when a strong local is wiping out the whole band.

A more exotic way of improving the r.f.-stage cross-modulation would be to improve the r.f. selectivity by using two or even three tuned circuits ahead of the r.f. transistor. Noise figure would suffer to a degree, but this is a compromise that the receiver designer is frequently required to make, even in a tube receiver.

Another means of improving the cross-modulation is to introduce degeneration in the emitter lead of a common-emitter r.f. stage. Caution must be exercised to assure that no more than 3 or 4 db. of degeneration is used, or the noise figure will deteriorate excessively. Other negative feedback schemes have been considered, but stability becomes a problem if any great amount of r.f. feedback is used.

TRANSISTOR MIXERS

A transistor used as a mixer will generally provide about 3 db. less gain than the same transistor operated as an r.f. amplifier. This is considerably different from tubes, where the conversion gain is approximately 25 per cent. of the tube's gain as an amplifier. R.f. gain in transistor front ends must be held to the minimum consistent with the desired noise figure, just as in a tube r.f. section; otherwise, mixer cross-modulation will become excessive.

A 10 to 12 db. mixer noise figure is fairly common for transistor mixers such as Philco 2N1743. In order to realise this noise figure, careful attention must be paid the recommended collector current and oscillator injection power requirements for the

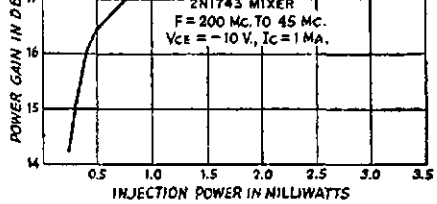


Fig. 7.—Gain vs. oscillator injection power, 2N1743 as a mixer with Vce equals —10 volts, Ic equals 1 mA. This curve applies over the frequency range 45-200 Mc.

particular transistor being used. Fig. 7 shows the effect of collector current on noise figure, and Fig. 8 shows oscillator injection power vs. mixer gain.

The formula for computing the effect of mixer noise figure on r.f. stage noise figure is

$$\text{Noise figure (power ratio) Fab} = \text{Fa} + \frac{\text{Fb} - 1}{\text{A}}$$

where Fab is the total noise figure, Fa is the noise figure of the r.f. amplifier, and Fb is the noise figure of the mixer. These are expressed as power ratios. To get the noise figure in db., take 10 times the $\log_{10}$ of the power ratio. A is the power-gain ratio of the r.f. stage including all coupling losses between stages. A numerical example is given below:

Fa = 4 db.; power ratio = 2.5
Fb = 10 db.; power ratio = 10
A = 10 db.; power ratio = 10

$$\text{Therefore, Fab} = 2.5 + \frac{10 - 1}{10}$$

$$= 2.5 + \frac{9}{10} = 3.4$$

$$10 \times \log_{10} \text{ of } 3.4 = 5.3$$

$$\text{Fab} = 5.3 \text{ db.}$$

The noise figure (5.3 db.) is now referenced from the base of the r.f. amplifier transistor. Antenna-coupling circuit losses must also be considered in determining the over-all noise figure of the receiver. Although it is possible

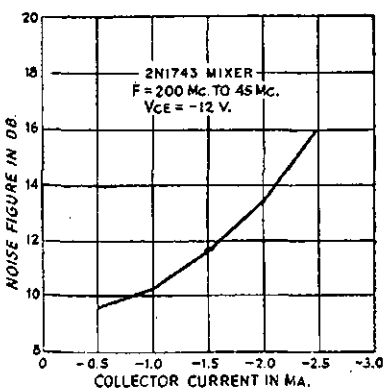


Fig. 8.—Noise figure vs. collector current, 2N1743 as a mixer, 45 to 200 Mc.

to compute the over-all noise figure including the antenna-coil tuned-circuit losses, it becomes somewhat involved because three variables affect it. These are the losses inherent in the tuned circuit (Q), losses due to mismatching, and the effect on transistor noise figure with change in source impedance. The computation of this is somewhat beyond the scope of this article. However, a good approximation may be made by setting the transistor tap on the input coil to match the input impedance of the transistor, measuring noise figure, and then moving the tap as close to the ground end of the coil as you can get, while still maintaining a 7 db. noise figure. This will keep signal levels to the r.f. stages as low as possible, thereby minimising cross-modulation.

Needless to say, it is very desirable to use as high a tuned-circuit coil Q

(Continued on Page 21)

FREQUENCY MARKER WITH 50 Kc. INTERVALS

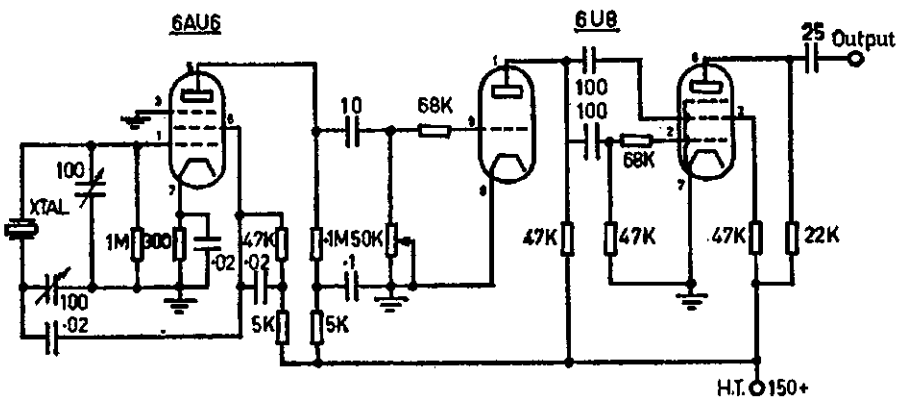
SOME of the luckier Amateurs have equipment with 100 Kc. calibrators built in and for them band-edge spotting is no problem, except where again is 7150, 14350 or 21450 kc.?

In looking up some information recently on frequency sub-dividers, multivibrators, I struck an old "QST" article describing a crystal oscillator locked 50 kc. multi-vibrator, and one evening decided to put it together in a hurry and see how it worked. Well, it works beautifully with a 400 or 500 kc. crystal, which are not so elusive as the 100 kc. rocks, nor so expensive, and because of the square wave output nature of the multi-vibrator, there is plenty of signal down to 10 metres!

Only two tubes are required, a penthode as Pierce crystal oscillator with provisions to adjust the crystal frequency up or down a bit and zero beat it against a frequency standard, and a triode-pentode with a 50K potentiometer to adjust the multi-vibrator frequency and make it lock in with the correct crystal submultiple (don't know a better word!).

Power consumption is very small, so could be taken from the existing receiver. Because of the simplicity of the circuit, no construction details or pictures are given. 400 or 500 kc. crystals can be procured from advertisers in "A.R."

—Arie Bles, VK2AVA.



RECEIVER FRONT-END DESIGN

(Continued from Page 19)

as possible in order to maintain the maximum r.f. selectivity for best cross-modulation performance.

AUTOMATIC GAIN CONTROL

The choice of an a.g.c. system in transistorised r.f. sections may have a considerable effect on cross-modulation characteristics of the receiver. In general, "forward" a.g.c., which reduces transistor stage gain by lowering the emitter to collector voltage, will provide better cross-modulation performance than the conventional "reverse" a.g.c., which controls gain by varying the base bias to reduce collector current in a manner similar to the bias control used with remote-cut-off pentodes.

Even better results can be obtained with a.g.c. systems where the controlled element is separate from the transistor stage. An example of this would be some form of a bridge or "T" network using a voltage variable capacitor, controlled by a.g.c. voltage.

CONCLUSION

As our technology expands, new tools for accomplishing our radio communication jobs are evolved. They are not always a direct advance in the state of the art, but must be considered carefully in the light of existing requirements.

In the case of the broad-band circuits discussed in this article, we have a definite step backward in cross-modulation and blocking capability. Modifying circumstances such as the need for light weight, portability, low power drain, low cost, or mechanical simplification may be worth the sacrifice in performance that accompanies the use of these design techniques. ●

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GELOSO TRANSMITTER

(Continued from Page 3)

prodding and wriggling the net switch can be dismantled and the extra wafer installed without removing any wires.

This new wafer is wired in such a way that the bleed resistor circuit is made in the a.m. and c.w. positions, but is opened on net.

The mounting of the relay is a matter of individual choice, but I found that by bending the vertical shield between the v.f.o. and final amplifier sections over at an angle of 45°, a small shelf was made on which the relay could be mounted in a position where all wires would reach without being cut or extended. Power for the relay will, of course, depend on the type. Mine is an industrial type with 230v. coil which is triggered by an extremely small single pole relay with a very high resistance coil operated from the in-built bias supply.

At first sight it may appear necessary to replace the 33 ohm resistor with a heavier one, but mine has been operating for nearly a year now without ill effect.

There is nothing very complex about these modifications. They do, however, make what is already a very efficient transmitter even more convenient to operate. ●

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub Editor: ALAN SHAWSMITH, VK4SS (Phone 4-6526, 7 a.m.-4 p.m.)
35 Whynot Street, West End, Brisbane, Qld.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

At the time of writing this, the "CQ" Contest has just run its course. The 21 Mc. band was alive from before dawn, until after dark. All continents except South Africa were heard. A few minutes after QRT time, the band had lapsed to its almost silent self, proving that it is lack of activity, not conditions entirely, that cause the higher frequency bands to seem so lifeless.

NOTES ANW NEWS

VS9HAA, VQ4IN/VS9H is active at the moment. This is the Kuria Muria Expedition in which Gus W4BPD and one or two others are figuring, making it a twenty-four hour affair. Gus' next stop is scheduled to be Sikkim, AC3PT, early in December, so he may possibly be QRT from this spot also by the time this reaches your mail box. (Man, how that fellow gets around.)

HZ2AMS is also creating pile-ups at the moment. Having a little s.s.b. trouble but is usually on 14010 around midnight for the c.w. men. Rather a slow op. QSL via R.S.G.B.

TT8, Tchad Republic, is scheduled to come on the air in December and continue through January. After this it will be TY, TJ8, etc.

Op. will be 5N2RSB, who is familiar to many already.

VP8GQ will QRT early in January. So you'd better keep an ear on the low end of 14 Mc. if you still want a QSO. He works 80 and 40 mx as well. QSL via R.S.G.B.

ZD3A reports that he is the only licensed Ham in Gambia. So that makes ZD3AL a pirate. The latter is quite active.

XZ2KN in Burma is on 20 mx c.w. at odd frequencies. Try after 7 p.m. E.A.S.T.

FR7ZD is on 21150 a.m. round 1700z. (This time no good for VK.)

W4VGL/KG6, Marcus Is., on 21 s.s.b. around 0000z and 7G1IX reported on 14002 at 2000z.

Mauritius.—VQ8AI has been reported on 14 Mc. c.w. around 0400z.

Central African Republic.—TL8SW was wkd. on 14 and 21 Mc. c.w. QSL via BP302, Bangui, C.A.R.

Turkey, TA. KV4DE, Howard, will be leaving in a few weeks for Turkey, where he has a job as a school teacher. He plans to take along his DX 100B, SB-10 and Drake 2-B and hopes to be able to operate.

New Hebrides, YJ1.—Rumour has it that Don HL9KH will DX-pedite to this rare one in December and January.

Christmas Island.—The Hammarlund gear will remain on Christmas Is. and will be used at VK9MB, who is supposed to have a better location than VK9DR. W2GHK will handle the QSLs for both VK9DR and VK9MB, to the Hammarlund Box 7388. Other stations reported active on the island are VK9ND, 14105 kc., s.s.b.; VK9MB, high end of 14 Mc. s.s.b.; and the club station, VK9XI.

Malaysia.—VS4FS is active on 14071 kc., xtal controlled, running 15w. Rumour has it that Gus may be in this area after the first of the year. Also VS4IH is active on 14 Mc. c.w.

Oman.—VS9OC has been reported on 14125 kc. around 1900-2000 G.M.T.

Gibraltar.—ZB2A is reactivated on 21054 kc., heard at 1500z.

Amsterdam Island.—FB8ZZ is on nightly. Try 21040 at 1700 G.M.T.

Crozet Island, FB8WW. A crew will attempt to set up a permanent station on this island early January 1964. Probably QRP c.w. and a.m. only. QSLs handled by 5R8BC.

(By courtesy Florida DXer, John K4IIF.)

San Felix, CE0XA. DX-pedition is planned to this spot if W money and necessary transportation can be arranged.

W6TI Bulletins—new sked—Sundays 0500, 1600 and 2100z on 14002 kc. Starting Nov. 0500z will be dropped and bulletins will be beamed to Australia on 7035 Kc. at 0730z.

CE0AD is on 7025-050 around 0000-0200z, c.w. and a.m., 500w.

YA.—K4UTE will leave Jan. 1 for a Peace Corps tour of two years in Afghanistan. He hopes to work from there and neighbouring countries.

Attention, 1.8 Mc. fans! VP8GQ is active on 1801. JAs get 1.8 Mc. privileges early this year. W4WQQ/VP9 will be QRX up there also.

Falklands.—VP8HJ will be on s.s.b. soon, if all goes as planned.

SD7 is the new call for new ZS7 ope.

Manchuria has been deleted from the A.R.R.L. Countries List.

VR6AC.—We regret that Floyd McCoy has joined the "Silent Keys".

(By courtesy of N.C. DXer, Editor WA6TGY.)

Marion Is.—ZS2NI has recently been heard on 7005 kc. at 0500 G.M.T.; also 14058 kc. at 1115 G.M.T. Fridays and Saturdays.

Baker Island.—W4VTL/KB6 operates on 21413 kc. daily around 2200 and 0100 G.M.T.

Togo.—VE3BSB/5V4 is reported to be in operation from Nov. for about four months.

Republic of Guinea.—7G1YX has been reported active on 14002 kc. at 2000z.

South Orkney Islands.—After a memorable reign with a strong signal and activity on all bands, 160-10 mx., VP8GQ will close down in about six weeks time, then will be QRT for about three weeks and will re-appear from the Falklands.

VR1B has been heard from the Pacific area, also FK8AU from New Caledonia can be heard around 14120 kc. on s.s.b.

Gus W4BPD says he will participate in no VK activity; so that's that, except that Gus does change his plans.

VP0, Anguilla.—Unofficial rumour has it that activity by W2s and VP9 could take place at any time from now.

Senegal.—6W8AC is active every week-end 2100-2200 G.M.T.

WA6IVM requests VK contacts on 1990 kc. c.w. from 1200 G.M.T. on Saturdays until the end of March 1964. He is using 200w. and Marconi antenna on that freq. (BERS195, Eric.)

VQ4CH, Geo. Watson, is migrating to Sydney and should reach Melbourne during Dec., by the ship "Canberra". Welcome to VK OM. (BERS195).

Ken VK3TL reports reaching DXCC during the past month. (Who said conditions were bad, hi! Nice work, Ken.—Al.)

John VK5KO comes to light with probably the most informative info. for the month, on conditions, etc. Reports to hand show that John is heard regularly on 160 and 80 mx overseas. Argument can always be waged on such things as Utopian QTHs, but VK5 does seem to be very favourable to Europe on the S. path.

ACTIVITIES

Ken VK3TL, who always gets more than a good share each month, comes to light with the following good ones wkd., 20 mx phone, mostly s.s.b.: AP5DC, CE1FX, CO8BO, CT1EY, CX2CO, EP2AU, ET3JK, F9RY/FC, FG7XT, JT1KAA, JT1CA, PJ2AA, PZ1AX, PZ1CE, ST-2AR, SV0WT (Crete), VE3BG/SU, TG9MP, TL0RC, TT8AJ, UH8AY, VP6WR, VP7CC, VP-7NS, VP9BY, VQ4RF, VS9HAA (Kuria Muria), YO3ZA, YV0AA (Aves Is.), ZP5CP, ZP5OG, 5B4CZ, 6O1WF, 9A1AIJ, 9N1MM. A1 mode: CR-7FN, EL0B/MM, EP2BQ, ET3JK, FB8YY, FB-8ZZ (New Amsterdam), JT1KAA, HP1IE, LU3ZIL (Antarctica), MP4BEE, PJ2CK, VP-2AV (Antigua), VP6RG, VP8GQ, VQ4IN/VS9H, VQ4IQ, ZP5CF, YS1O, 5R8AI, YA1BW. Some QSLs rcd. were PJ3AO, VQ8AI, GB2SM, OH-2EW/OH0 (Ahland Is.), VP5DB, PJ5MF (Sint Martin), FG7XT, MP4QBF.

Don L2022 reports he is on 272 heard and finding new ones not too plentiful. He lists, 14 Mc. c.w.: HM1AP, ZK1AR, 5B4OS, SP6OM, AP5HQ, UW0FK, 5A3TX, AP5AR, UM8KAA, FB8ZZ, ZL5AA, UF6FN, VR2EH. 14 s.s.b.: VK-9DR Xmas Is., G2PU, PZ1AX, FK8AU, JT1CA, PJ2AA, VK0VK, HK3LX, XW8AL, BV1USG. 7 Mc. c.w.: UA0KCU, KX6BU, HA5KAG, YU-6FE, YU3BC, YO4CI, DJ8GB, FU8AG. 21 Mc. c.w.: JA1YL, YA1A, VS1FZ, F8IH, UD6DU, UA9EU. 1.8 Mc.: VK5KO.

Dave VK3QV has given up the struggle on 28 Mc. for the time being and dropped down to 21 Mc. where he wkd. on a.m. F3FZ, VK-9SM and all G areas as well as Js and Ws. On c.w. he wkd. F2MA, G6RJ, KR6ML, DJ4SG, OK1AFC, ON5ZO, SP9RF, SM5KV. Also hrd. were G2JB, DJ2AA, DJ8MI, MP4Q, ON4CK, SM5BPJ, SP7LA, VS1LG, OH5SM, OE2WDI, SP7HX, HS1S, KR6BF and many others. (This list shows that the band does open, which was proved in the "CQ" test when all continents were workable. The Europeans mostly at dusk. —Al.)

Eric BERS195.—Best loggings, heard 160 mx: VK5KO, ZL3OX, VK3ABT. 80 mx.: W4KFC, W6RW, Js. 40 mx: F2CB/FC, KR6NG, MP4QBF, VQ4IN/VS9H (Kuria Muria), VQ4IV, VS1LU, VS9HAA, ZB1BX, 4X4SW, YO4WR, JA8COM /MM. 20 mx: CN8FW, FU8AG, CO2BB, FB-8YY, HK3AH, HK5TD, HP1IE, HM1AS, KX6AJ, FB8ZZ, VP9FK, VK8HA, TG9AD, VR1G, VS-6EG, VU2GWG, UM8KAA, YV1DP, YV5DE, ZB1BX, VS9HAA, SV0DK and many more. QSLs rcd. KP5BTU, KZ5CU, UD6RW, UJ8AH, UL7BG, VK5HG, VQ2W, VR1N, 9M2FT, UM-8KAB, VK4WV (Willis Is.).

Peter Drew has sent in an enormous list of stations heard on all bands from 15 to 80 metres using all modes. There are over 500 stations listed and unfortunately space limitations do not permit printing same. The number of stations heard over a period of one month shows that the DX is certainly being heard in Western Australia.

THANKS

Thanks to HB9BX for this s.s.b. snippet:
1st voice: "Your signals are drifting badly."
2nd voice: "No. I am following you."
3rd voice: "You are both moving in opposite directions. My receiver must be haywire."

My thanks again to all those, who in 1963, took the time to write and help the column along.

A prosperous 1964 and DX to one and all. 73, Al, VK4SS.

VHF

The DX has arrived on 6 metres and each State is working its share. Many new calls are appearing and some old ones are being used again. All States (VK1, 2, 3, 4, 5, 6, 7, 8, 9) are represented, so with just a fair share of luck and good conditions there should be an increase in the 50 Mc. W.A.S. certificate awards.

VK9ZBV has been down south into VK3 on 29th Nov. A signal on 50.75 which could be 8ZCX has been heard a number of occasions in VK3 but no identification on the carrier.

JAs have been heard on at least three days during November in VK3. VK3ZER scored JA2AYM on 24th. I was copying the JA but could not positively identify him at the same Bon worked him at 1400. Others heard JAs as early as 0630 same day.

Northern VK4s have also been amongst the JAs in recent weeks.

The band has been open from ZL to VK since 23rd. First in VK3 on 27th with ZL3 and almost daily until end of the month.

Numerous odd signals from VK5 and VK7 heard in VK3 during openings, but nothing worked to date. Nothing heard from VK6 direction to the end of November.

The early closure of the notes leaves the page a little bare for this month. 73, 3ZGP.

QUEENSLAND

The v.h.f. meeting was held on Friday, 15th Nov., with about a dozen members present. At the meeting was the latest arrival on six metres—Roy 4ZRM, who puts out a fine signal from Annerley. Also on the air is Ron 4ZRJ who has recently returned from VK9. His operating frequency is 50.45 Mc. and is using 13w. to a 5763 and quarter wave length of hook-up wire. By the time you read this, he will have a 2 element beam in operation.

At the time of writing these notes, Malcolm 4ZEL and Allan 4ZAW are mobile somewhere in VK3. George 4ZLG is mobile and will be going to VK3 at the end of November.

The summer DX is coming good with VKs 1, 2, 3, 5 and 7 being worked and a VK6 has been heard also.

Victor 4ZBT gave a lecture on Satellites to the monthly meeting of W.I.A. Several of the Brisbane boys are interested and will endeavour to track the satellite. 73, 4ZDF.

WESTERN AUSTRALIA

Here in W.A. the coming of the summer months has meant a considerable rise in v.h.f. activity and as well as hearing a number of seldom-heard call signs on the air, a number of V.h.f. Group projects are also under way.

The 50 Mc. beacon tx which has been in operation at Cocos Is. for some time is being returned to Perth for an overhaul and it is planned to send it to Christmas Island where it will be operated by members of the Christmas Island Radio Club.

By the time that these notes are in print the new VK6VF beacon should be on the air and the details of operation are: Freq., 60.002 or 52.002 Mc. (depending on when the 60-52 Mc. band is lost); operation, virtually 24 hours a day; identification, call sign VK6VF keyed by using frequency shift keying (850 c.p.s. deviation); power, about 40 watts.

It is unfortunate that the new beacon was not ready for use sooner, but a considerable amount of work is entailed in building a beacon which is to run continuously. The old beacon, incidentally ran for a total of about 20,000 hours, using the original output valve (an 807).

A number of 70 Mc. f.m. mobile transceivers have been purchased by the Institute for use in conjunction with the W.I.C.E.N. organisation in this State and these units are being modified for use on the 50 Mc. band. Small quantities of 70 Mc. a.m. mobile transceivers are also starting to become available, but it hasn't been decided how these will be used as yet. There is a chance that these units could be converted to f.m. operation with surprisingly little work and if this is the case they will be used to expand the 50 Mc. f.m. net.

The only other news of interstate interest is that Trevor 6ZDZ will be operating portable in Adelaide during the University vacation and no doubt those in VK5-land will know that he is around by this time. 73, 8ZDB.

SWL

NEW SOUTH WALES

During 1963 the VK2 Group showed a marked improvement on previous years. Attendances at the meetings were quite good. I feel sure that if more of our Group would come along they would enjoy what is offered and would certainly come again. Our thanks go to Phil 2ZPI and Tim 2ZTM for their continued support, and their patience in imparting knowledge which is a great inspiration to s.w.l's. We are indeed fortunate in having two such stalwarts who are always there to help us on our way.

Our October meeting was a great success. Phil 2ZPI gave an interesting talk on how to construct an all-band antenna and explained a three-transistor converter for 3.5, 7 and 14 Mc. If any s.w.l. would like a copy of the above converter circuit, just drop me a line, plus a stamp and its yours.

Our Secretary still has a few copies of the AR7 manual on hand and members can purchase same for 10/6 plus postage. Write to Tom Harding, 33 Waratah St., Berowa, N.S.W.

We offer our congratulations to Ross L2233/VK4 and to L2023 for their respective wins in the last N.F.D. Contest; good work lads.

Sid L2258 has his AMR300 going on all bands except 80 mx at the moment. He sends word of logging OA, G and F2, which is not bad going on any rx. Sid intends having a go for his ticket and we wish him well.

Ross L2233/VK4, who lives in the Rockhampton area, sends news of the prospects of a new rx, a GR59. He intends to use his 163T for portable work and the other for his fixed station receiver.

Chas. L2211 reports that his 50 Mc. converter is not working, but Vince VK2VC has the matter under control.

Thought for the month: Use the right tool for the right job. 73, Chas. L2211.

DX LADDER

	Countries Conf.	Countries Hrd.	Zns. Conf.	S.s.b. Conf.	S.s.b. Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	272	38	20	104	35
A. Westcott	93	159	31	9	107	11
M. Hilliard	83	235	33	29	165	12
M. Cox	80	229	29	39	150	18
P. Drew	66	199	27	29	131	14
C. Aberneathy	56	96	30	—	—	—
N. Harrison	44	119	29	4	20	35
I. Thomas	42	139	20	16	97	14
G. Earl	38	131	22	20	104	3

TYPE F1 EMISSION

Postmaster-General's Department

Treasury Place,
Melbourne, C.2, Vic.
13th Nov., 1963

Federal Secretary,
Wireless Institute of Aust.,
Box 2611W, Melbourne.

Dear Sir,

Further to our letter dated 26th July, 1963, in connection with type F1 emission in the Amateur Service (your letter of the 8th September refers), arrangements have now been made with effect forthwith to include type F1 emission, employing a maximum frequency shift of 850 c.p.s., in the types of emission permitted for use by the Amateur Service within all authorised frequency bands. The use of type F1 emission shall be confined to radio-teletype (R.T.T.Y.) systems employing a teleprinter type equipment using perforated tape or direct keyboard transmission and a printing mechanism for reception. The use of hand-speed Morse utilising type F1 emission is prohibited. R.T.T.Y. transmissions shall employ a five-unit code in accordance with International Alphabet No. 2.

For purposes of station identification in accordance with paragraphs 132 and 133 of the "Handbook for Operators of Radio Stations in the Amateur Service," July, 1963, which read—

"132. The operator of an Amateur Station shall transmit the call sign of the station being worked and the call sign allotted to the station that he is operating at the beginning and end of each session, and at least once in every five minutes during the session.

133. Call signs must, in all cases, be signalled in full and in such a manner as to leave no doubt as to their identity, and must include the nationality prefix letters 'VK',"

an Amateur Station licensee employing type F1 emission shall transmit call signs either by means of hand-speed Morse (type A1) or radio telephony (types A3 or F3) signals.

It is not proposed that the Department inform each Amateur Station licensee of the new condition at this stage, but it would be appreciated if you would be good enough to arrange for appropriate publicity through the Institute's Divisional Broadcasts and Magazine "Amateur Radio," please.

Yours faithfully,

(Sgd.) L. F. Pearson,
for Director-General.

NOTES

FEDERAL

FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the Federal Constitution of the Wireless Institute of Australia 1947 as follows:—

(a) Delete Clause 21 and substitute—

"21. The Headquarters Division shall call for nominations annually from its members for appointment to the Federal Executive, such nominations to be received not less than 60 days prior to the conclusion of the fiscal year. The nominations which shall include the names of any retiring members of Federal Executive willing to re-nominate shall be submitted by the Headquarters Division to Federal Council for the appointment by preferential vote of seven members, two at least of whom shall be retiring members."

(b) Insert new Clause 21a—

"21a. The new Federal Executive shall take office at the conclusion of the Federal Convention which they shall attend, or where a Federal Convention is not held, within one month of the conclusion of the fiscal year. The Federal Executive shall determine its own offices in such manner as considered necessary."

(c) Delete Clause 24 and substitute—

"24. The appointment of Federal Executive which shall be finalised by the Headquarters Division not less than 14 days prior to the conclusion of the fiscal year shall be notified in writing to Federal Council prior to the conclusion of the fiscal year. The Federal Executive shall notify Federal Council in writing of the offices and appointees thereto within 28 days of the commencement of the new fiscal year or the Federal Convention whichever is the sooner."

Any member of the Institute not in agreement with the proposed alterations should notify his disapproval and the reasons to the Federal Secretary within 14 days of the publication of this proposal.

— . . . —

FEDERAL QSL BUREAU

The new address for the W2-K2 QSL Bureau is North Jersey DX Association, P.O. Box 303, Bradley Beach, N.J., U.S.A.

Graham VK2AGH will handle any cards for VK4HG and VK4WV who were at Willis Island and also for VK4JQ who is presently at Willis.

Albert Zander, VK3PG, who was active on the h.f., v.h.f. and u.h.f. bands for many years until 1960, has decided to make a comeback. Bert has acquired some very fine gear and should soon be heard on s.s.b. and later on c.w. Gear consists of HT transmitter, SX receiver and a TA33 Jnr. mounted on a fine tower.

Bruno Bossert, HB9QO, was due to arrive in Australia on 28th November and after a stay of about six weeks in Sydney will come on to Melbourne where he will be employed by Landis and Gyr for about two years. Bruno hopes to become active under a VK call sign. Writer had the good fortune to meet Bruno at his home at Nottwil just outside Lucerne.

Preliminary details of the 1964 A.R.R.L. International DX Contest have been received. The dates are: Phone, Feb. 8/9 and March 14/15; C.w., Feb. 22/23 and March 28/29. The rules are unchanged from 1963.

—Ray Jones, VK3RJ, Manager.

— . . . —

NEW SOUTH WALES

HUNTER BRANCH

The December meeting of the Branch took the form of a combined Christmas meeting and welcome back to Lionel 2CS. A large gathering of 45 members, visitors and associates, including quite a number of ladies, watched with great interest as the guest of honour, Lionel, showed and commentated on a number of very interesting projected transparencies illustrating his world tour. All this, together with the pleasant chat after the meeting, made for a most enjoyable evening and all who attended agreed.

Amateur activity in Cessnock is at a peak at present with the formation of a new Radio Club under the patronage of Chris 2PZ. This club, which has the call sign 2AXC, is closely linked with the Cessnock branch of the Civil Defence. They should be on 40 and 80 mx very soon and there is a rumour that one of the items of equipment to be used is an AT21, so there should be no shortage of signals.

Whether there will be an increase in signal strength from 2AWX this year remains a matter of conjecture. Plans are in hand for an increase in power so the best thing to do is to listen to the local broadcast on 20th Jan. and judge for yourself. About this time also there will be some examination activity locally when several candidates will present themselves for the A.O.C.P. Paddy Maloney was successful at the October exam. and we are now waiting to hear what his call will be.

Late in November the Scone Apex Club held a hobbies and crafts exhibition at which an Amateur Station signing 2AWX/P was in operation. This activity further enhanced the good name of the W.I.A. and Radio Amateurs in the Hunter Valley and introduced many to the hobby for the first time.

If you see a large steel structure at Bennetts Green in the future, be not afraid. It is Ross' new mast—about 120 feet high and ex a broadcast station—which was given to him! Jack 2KQ has his gear back in operation and is putting in a fine signal. Gordon 2ZSG has found the hum in his rx. It turned out to be some unshielded leads in the two in line and not a noise from the distillery as was first imagined. Bill 2ZL is making very good use of the new tape recorder. He has recorded the voices of all the local boys and is making a secret sound tape for one of our forthcoming meetings. Frank 2FC has discovered a new sine wave distorter. The trouble is he found it in his modulator. Frank 2APO is working on our behalf again and is arranging that the film "Friendship 7" will be available for screening at the next meeting. This is a really good film and is very worthwhile seeing.

Regarding the next meeting, which will be on 7th February, it is hoped that it will be in room 15 at the Tech. College. However, since arrangements may change in the new year, it would be as well to listen to 2AWX for the final arrangements. Remember that 2AWX broadcasts news each Monday at 7 p.m. on 3595 and 144.443 Mc. and that meetings are held on the first Friday of each month, excepting January, at 8 p.m. in the Technical College, Tighes Hill. See if you can get more contacts and better DX in 1964 and let's use all the bands all the time we can. All the best for the New, Year. 73, 2AKX.

— . . . —

QUEENSLAND

TOWNSVILLE AND DISTRICT

As these notes appear the old year will be gone and the new one off to a bright start, as the conditions appear to be on the up grade. European stations can be heard coming through in the afternoon and everyone of us trying to get a contact with the resultant bedlam.

The near north causing some consternation due (maybe) to the conditions interfering with the outback radios on the Flying Doctor Service and the Ambulance Service. Looks like the I.T.U. band allocations are being disregarded. Wonder what would happen if it was a poor Amateur?

Things are very quiet here locally and not many working the 14 Mc. band, although can hear a few of the old timers rag-chewing on 7 Mc. and seem content to let the DX stations go by. Apparently they have given up the rat race in chasing those elusive awards, which seems to get many in.

Herb 4JW heard after a long time from Charters Towers, not like when in Cairns, must have a new interest. Vern 4LK only heard working Ken, while the Ingham boys are not heard at all. Basil seems to be still holding the fort for the Cairns gang and Claude from Ayr a bit uphill now he has sold that beaut. receiver and uses a makeshift. Bert still trying for better output from the quad. Heard that one of the locals is in for a transfer to the bright lights after many years here—still hush-hush. 73, 4RW.

— . . . —

TASMANIA

Around 28/11/83 2AXR visited southern VK7 and was shown around quite a few of the shacks. Al was relieving Radio Officer aboard the Patina on the Sydney-Hobart run. Hope you enjoyed your brief visit Al and will be back again some time. Ian 7ZZ is back on deck again and once again hard at work. Still finds time for the DX though, and recently worked VK0BE (VK7ZBE) down in the white wastes. Brien is apparently having a whale of a time, enjoying really hot days—up around 27 degrees. Knowing Brien, I guess he is the life of the party down there.

During the latter part of October, Snowy 7CH operated maritime mobile from his yacht in the vicinity of Bruni Island for a week.

The Hamfest at Cambell Town in November was a success with an attendance of 47 members. A good time was had by all and the weather was reasonably good for camping, just holding off a really strong blow towards the end of Sunday afternoon. Look forward to seeing you there again next year. An article will be published in the mag. later this year giving fuller details of the week-end's activity.

That's it for this month chaps, all the best for the New Year, 73, Mike 7ZAV.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. **Copy** must be received at **P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month**, and remittance **should accompany** the advertisement. Call signs are now permitted in Hamads. Dealers' advertisements not accepted in this column.

FOR SALE: Collins ART13 Transmitter, 813 final modulated by two 811s, good disposals condition, unmodified, complete with low frequency v.f.o., original supply, large manual, and all tubes, £25. ATR2B Transceiver, working with all tubes and d.c. power supply £15. 1 only 122, complete with power supply, etc., unmodified, good working condition, £15. 1 only 122, complete with power supply, valves, etc., but not working, £5. VK2AAK, Kulnura, N.S.W.

FOR SALE: Prop. Pitch Motor £10. 6 Kc. a.m. Mechanical Filter, brand new and unused, £7/12/6. H. Hepburn, VK3AFQ, 4 Elizabeth St., East Brighton, Vic. 96-2414 evenings.

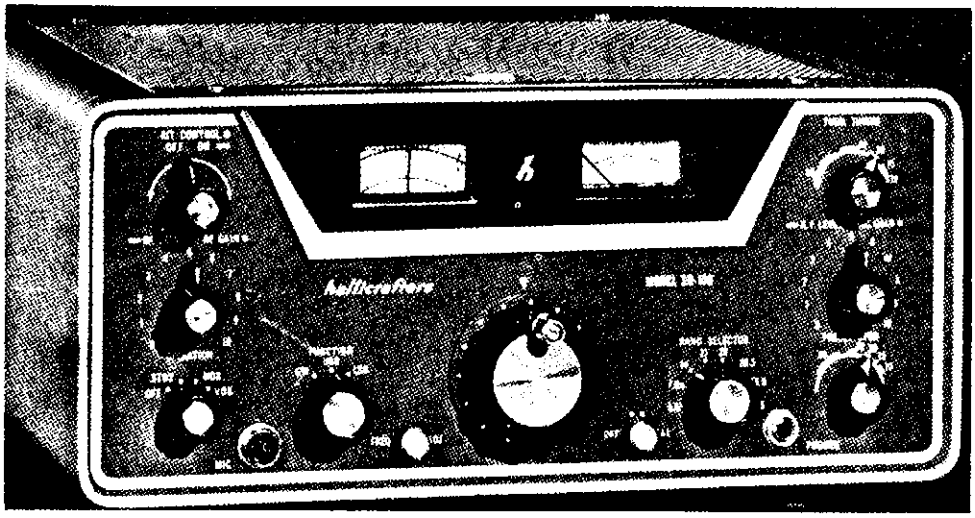
FOR SALE: 1 only 12 volt Tafaz (imported) Transistorised Power Supply for Swan or Collins, or similar, Transceiver. Good condition, very little use and very compact. £60. VK2AAK, Kulnura, N.S.W.

SELL your own **Personal** gear through Hamads. Persons trading in any line, regardless of price, or quantities of similar articles, will be charged commercial rates.

WANTED: Xmitter, all bands, c.w.-a.m. or c.w.-s.s.b., 100 watts max. Also all-band 3 element beam. Bill Barber, VK6DX, 15 Whitlock Street, Kalgoorlie, W.A.

WORLD RANGE

RECEIVERS — TRANSMITTERS — TRANSCEIVERS



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SR150 TRANSCEIVER
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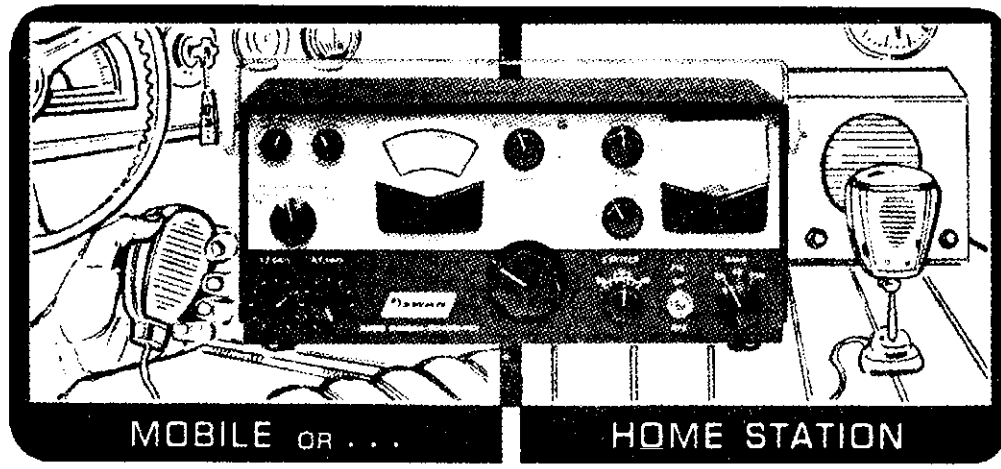
HT32B TRANSCEIVER
HT44 TRANSMITTER
HT45 LINEAR AMPLIFIER
SX117 AMATEUR RECEIVER
SX122 GEN. COV. RECEIVER
SX110 GEN. COV. RECEIVER
SX118 GEN. COV. RECEIVER
S108 GEN. COV. RECEIVER
S120 GEN. COV. RECEIVER
SX115 AMATEUR RECEIVER
XMITTER ACCESSORIES

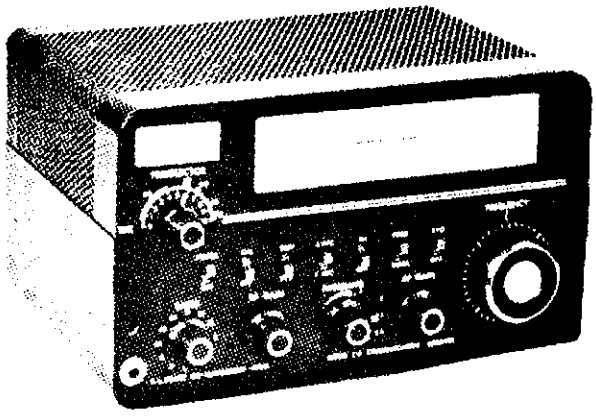
SWAN *(Right)*:

SW240 VK TRIBAND TRANSCEIVER
SW240 AC POW. SUPPLY
SW12 DC POW. SUPPLY
SW-VFO/TCU TRANSCEIVER, VFO, VOX, SPK, CAL, and POWER SUPPLY.

DRAKE *(Below)*:

2B AMATEUR RECEIVER
TR3 TRANSCEIVER
ACCESSORIES by B. & W. W.R.L., HYGAIN, and BANDSPANNER.





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10b Douglas Street, Noble Park — Phone 746-8448

S.A.: TELEVISION & RADIOTRONICS
12a Gays Arcade, Adelaide — Phone 23-2474

QLD.: GENERAL IMPORT DISTRIBUTORS
135 Lutzow St., Wellers Hill, Brisbane — Phone 16-5097

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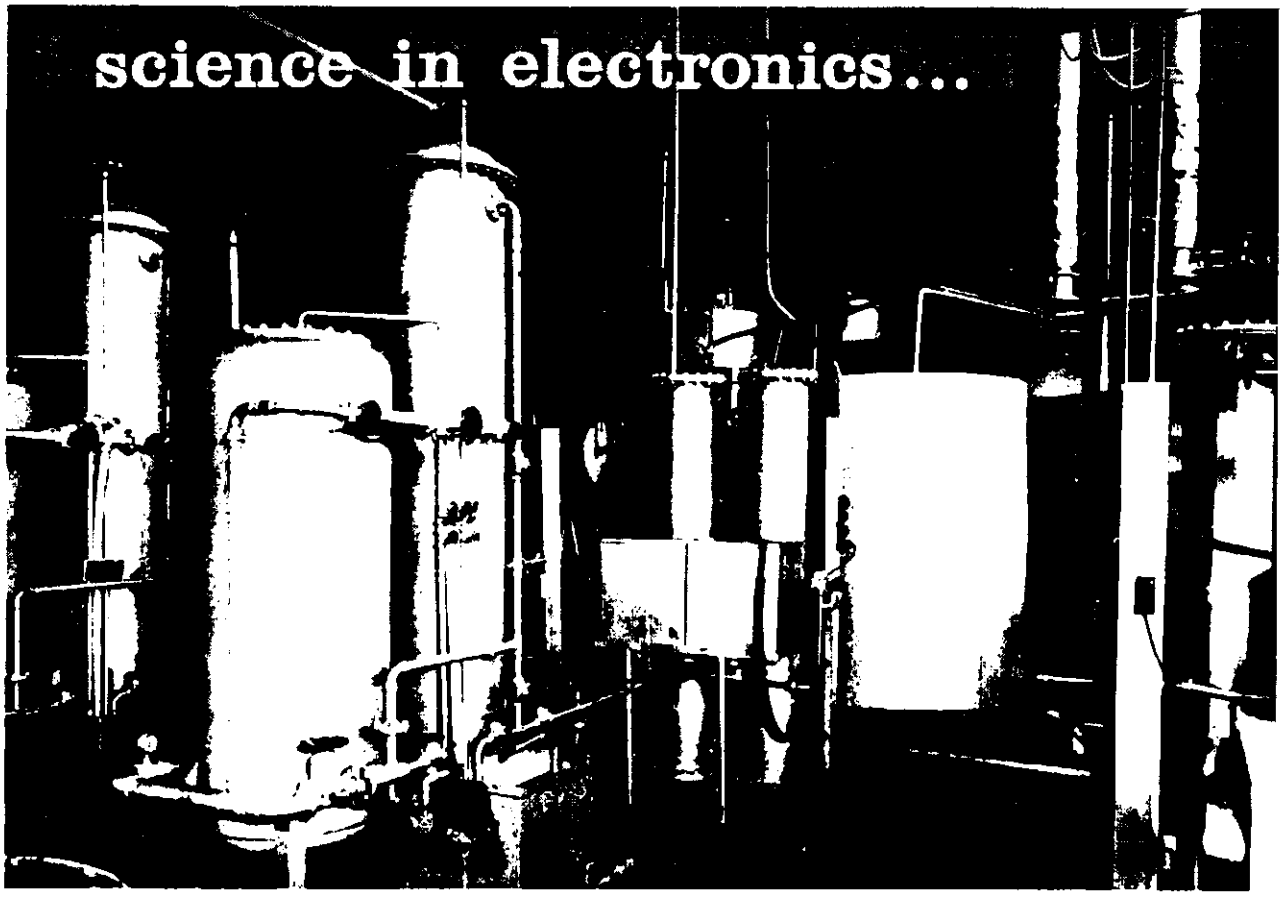

AWV CONTINUOUS-TREATMENT WATER PURIFICATION PLANT

WATER PURIFICATION

Since tap-water contains sedimentary, organic and inorganic impurities it needs intensive purification before it can be used in an electronics factory, for example, for picture tube screen settling or in transistor manufacture.

A continuous-treatment water purification plant has been developed at A.W.V. in which initially chlorine is used to destroy slime-forming organisms and sediments are removed by coagulation and settling. The treated water is then passed through sand filters to remove suspended particles and through activated carbon filters to remove free chlorine. Inorganic salts are then eliminated by means of mixed-bed ion-exchange equipment.

The degree of purification obtained in the A.W.V. plant is such that the greatest metallic impurity is less than one part in ten million, total solids are less than one part in a million and the water is virtually an insulator—the resistance between opposite faces of a one centimetre cube is from five to ten megohms!

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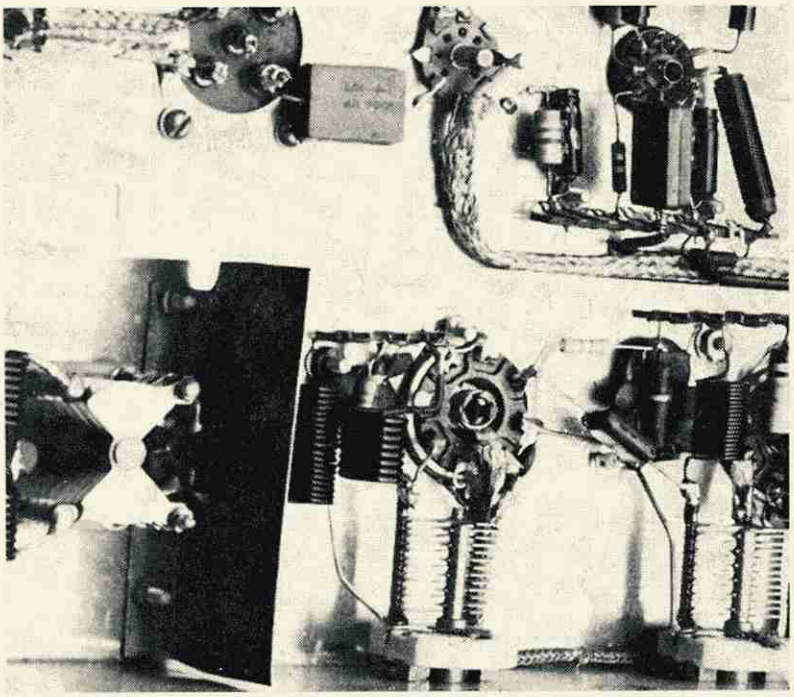
AMATEUR RADIO

FEBRUARY 1964



Vol 32 No 2

2/-

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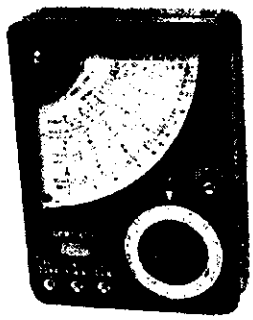

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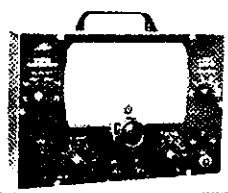

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OUR COVER

An unfinished project for a v.h.f. transmitter forms the cover photo. Details will be given in a later issue of "A.R.," together with full constructional data.

FEDERAL COMMENT

★

is the Future of the Amateur Service in the Balance?

This is a question which every Amateur in the world might well ask himself or herself and one which vitally concerns the Societies representing the Amateur Service in the various countries where Amateur transmitting is permitted.

Those who have taken the interest in Australia to read the facts relating to International Conferences cannot help but wonder how long the Amateur Service can hold out against the ever-increasing pressure for frequency space by the rapidly expanding commercial services.

If you are concerned about the future of your hobby you are commended to read the article "Two Plus Two Equals Four" by A. Prose Walker, W0DCA, W4CXA, in the October 1963 issue of the American Amateur publication "QST".

As well as giving an enlightened and experienced background of the modus operandi of International Conferences, Mr. Walker points up the great and urgent necessity for a world-wide Amateur programme of "defence" as a barrier against the future loss of Amateur frequency assignments. His summary in three major points is worthy of reprinting in this magazine . . .

(1) **"We must upgrade the Amateur Service to keep pace with the state of the art and through this acquired status gain increased prestige and respect from people and governments who exert vast influence on communications.**

(2) **"We must prepare for conference participation on both the national and international levels.**

(3) **"We must establish liaison throughout the world to the end that we all work together in presenting a united front to our respective governments, and through them, to the I.T.U."**

The Wireless Institute of Australia, representing the Amateur Service in this country, has been working along the line of these three major points for the past five years or more with greater vigor than hitherto was possible.

Our policy is now being planned a long way ahead and the road will not be an easy one. Whether you hold an A.O.C.P. or an L.A.O.C.P., your cherished hobby hangs in the balance because the pressure for frequencies now extends from the b.c. bands into the gigacycle region. If countries like America, where Amateur Radio holds the highest population density, are concerned with future prospects, then the problem is multi-fold in Region III. where the density is far less and widely dispersed. We might add another important point to Mr. Walker's summary . . .

(4) We must use every resource at our command to encourage the full and continual use of every frequency assigned to the Amateur Service.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

INTRODUCTION TO CERAMIC DIELECTRICS*

PART ONE

H. F. RUCKERT,† VK2AOU

AN ever-increasing variety of ceramic parts is being used in electronic equipment, and the ceramic dielectrics are one particular type of electronic ceramic. Before discussing the capacitor dielectrics in detail, it may be of interest to mention at least other electronic ceramics.

ELECTRONIC CERAMICS

(a) Low-loss steatite in 1932/34 replaced the electrical porcelain used as insulator material, in order to reduce electrical losses at radio frequencies. Dense aluminium oxide parts are also now being used for important applications in v.h.f. valves as vacuum-tight, low-expansion insulators.

(b) Ferrites, which contain mainly iron oxide plus zinc, manganese, nickel, etc., are now very widely used as core material in coils and transformers of b.c. receivers, tape recorders and t.v. sets, or as permanent magnets in loud speakers, t.v. sets, etc.

(c) Other ceramic bodies become semiconductive due to their composition and/or firing atmosphere and form voltage and temperature sensitive resistors, which are called thermistors, varistors, barrier layer capacitors, etc.

(d) Piezoelectric ceramics may soon replace many fixed tuned circuits in electronic apparatus, doing the combined job of a pair of coils and capacitors; also, they are superior to the seignette salt crystal so often employed in gramophone crystal pick-ups, microphones, and piezo ceramics are now being tried in motor ignition systems, etc.

(e) Special porcelains have long been used as the element carrier of carbon and wire-wound resistors.

(f) Glazes, ceramic flux or enamels found important applications in connection with the surface protection of ceramic insulators, transmitter capacitors and wire-wound resistors, as well as flux to bond painted-on silver, palladium, etc., electrodes to the ceramic base.

DEFINITIONS AND PROPERTIES

WHAT IS A DIELECTRIC AND A CAPACITOR?

The capacitor or electrical condenser was first reported to be used by Gray in 1735, by von Kleist in 1745, and by Cunaeus in Leyden (Leyden Flask) in 1746.

Gray used a glass bottle filled with water to collect electrostatic charges. Von Kleist found that the condensation of many small sparks, by charging the water in the bottle, was much improved by holding the bottle with one hand, because the discharging spark was now much stronger. In these cases, the water acted as one electrode, the glass as the insulating dielectric and the table or hand as the other electrode.

Cunaeus used metal foil as inner and outer electrodes, a technique still applied today, and we, therefore, call the "Leyden Flask" the original capacitor. We define a capacitor or electrical condenser as an electrical component consisting of two opposite placed electric conductors with an insulating medium "the dielectric" (vacuum, gas, liquid or solid) between these conducting electrodes.

What can we do with an electrical capacitor?

CHARGING, STORING, DISCHARGING, BLOCKING AND BY-PASSING

Charging: By connecting the electrodes to a battery or electric power supply, we notice that an electric current is rushing into the capacitor, which soon stops because the dielectric insulates both electrodes from each other.

Storing: Is the dielectric a good insulator, have steps been undertaken so that air humidity does not cause a conducting path to form, and is the insulation margin clean (no finger prints)? If so, then the charge can be stored in the capacitor for quite some time after it has been disconnected from the battery.

Discharging: The capacitor can be discharged by connecting a wire across the electrodes causing a short circuit, indicated by a spark.

Blocking: These experiments show us that d.c. is charging the capacitor but, after that, a further current flow is blocked by the dielectric.

By-passing: Applying a.c. to the capacitor means that we charge, discharge, re-charge with opposite polarity and discharge the capacitor again in quarter sine wave cycle steps repeatedly or continuously. That happens if the capacitor is connected to a power point. If we connect an a.c. current meter in series with the capacitor and the a.c. source, we will obtain a reading, which means that the effect of charging and discharging (a.c.) is transferred by the insulating dielectric to the other side without actually conducting the current.

This means that a capacitor can be used to separate d.c. from a.c. by blocking d.c. current and by-passing a.c. The by-passing effect is expressed as a.c. resistance of the capacitor called "**capacitive** reactance" (X_c).

UNIT OF CAPACITY

To express the storing capability of capacitors, we use the basic unit of **Farad** (Faraday).

1 F. holds the electric charge of 1 Coulomb (quantity) with 1 V.

1 Coulomb = 1 Amp. in 1 Sec. charging current.

In practice, we use smaller units:—

$$\frac{1}{1{,}000{,}000}\ \text{F.} = 1\ \mu\text{F.},\ \text{or}$$

$$\frac{1}{1{,}000{,}000}\ \mu\text{F.} = 1\ \text{pF.}$$

There are many types of capacitor meters now available to assist us if we wish to measure a capacitor.

Let us now look at the main properties.

K FACTOR

If we replace vacuum dielectric or dry air, which are nearly the same in this regard, by other insulating materials, we will usually observe a bigger charging and discharging spark, which indicates a higher capacity value. The degree of capacity so increased or multiplied is called "K Factor", permittivity or dielectric constant, and it is a ratio figure only without dimensions. The relationship between the capacitor dimensions, K factor and capacity is expressed as follows:—

$$K = \frac{\text{CpF.} \times \text{thickness}}{\text{eff. area} \times 0.224}$$

where thickness is 0.001".
area is in square inches.

Ceramic materials cover the widest range of F factors of all substances: 4 to 15,000.

Mica K, 7-8; glass, up to 18; plastics, 2 to 4; porcelain, 4.5; steatite, 6 to 7; distilled water, 81.

We divide ceramic dielectrics into two main groups, LK and HK, or $K < 1{,}000$ and $K > 1{,}000$ group.

The K factor varies with frequency, voltage, temperature, time and shape of the dielectric, the composition and manufacturing processes.

TEMPERATURE CO-EFFICIENT OF CAPACITY, TC_c

LK: Since the K factor is by no means constant, we don't use the old term "dielectric constant" any more. The change of K factor or capacity with temperature is called the TC_c or temperature co-efficient of the capacity. Negative, zero or positive TC_c values can only be achieved with ceramic dielectrics, which is the reason they are so important.

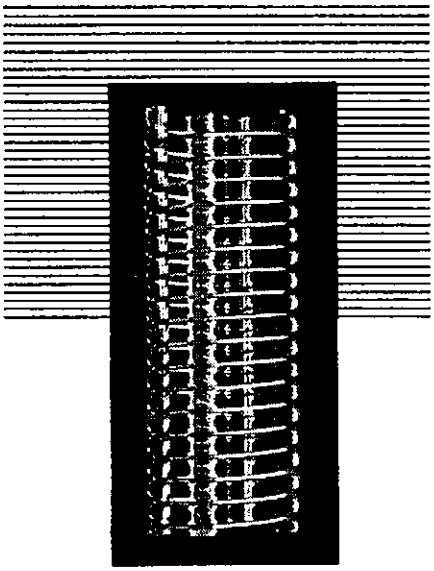
Radio Example: All radio or t.v. receivers, and many other electronic apparatus, have tuned circuits, each consisting of an inductor (in form of a coil) and a capacitor to sort out the desired radio station (frequency) from the many signals arriving at our aerial. Temperature variations, during the warming up period or later, cause a change of electrical properties of components which affects the radio receiver tuning, and frequency drift, loss of gain and selectivity are the results.

These effects can be automatically eliminated by incorporating ceramic capacitors with the required TC_c, or a combination of LK capacitors can be used, which compensates the TC of other components to a high degree.

The TC_c is determined by measuring the capacity variation ΔC per degree C. of temperature change Δt:—

* From a Lecture given to the Ceramic Society of Australia (N.S.W. Division).

† 25 Berrille Road, Beverly Hills, N.S.W.



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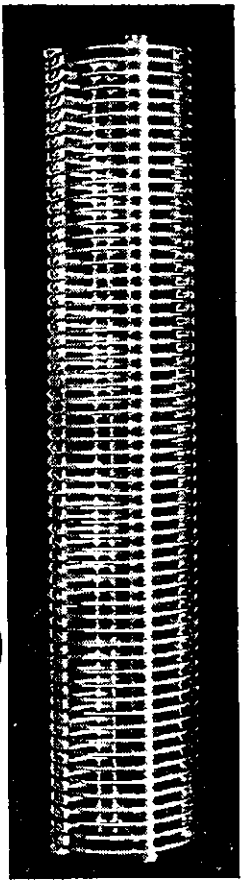

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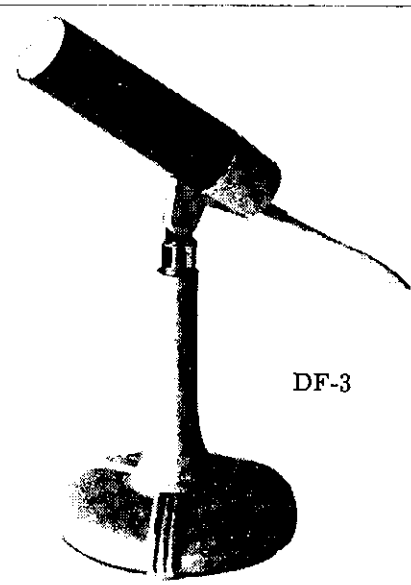

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$$\frac{\Delta C \times 10^6}{C_o \times \Delta t} = TC_c \text{ p.p.m.} \begin{cases}\text{parts per}\\ \text{million}\end{cases}$$

C_o is initial capacity.

LK materials are being made with TC_c values from P150 to N5600, measured at 1 Mc. between 25 and 85°C.

All bodies have a certain low frequency and high temperature where the TC_c goes through zero (N.P.O.) and where the TC_c curve is no longer nearly linear.

HK: HK ceramics give usually high enough capacities for coupling and by-pass applications, and there is no need to use them in tuned circuits, so that their peculiar TC_c is of little importance. They have one or two K peaks between 0 and 150°C., which means that the TC_c curve shows several P, N.P.O. and N. regions.

The K peak is called Curie Point, because a change in the crystal structure of the used Ba TiO_3 from tetragonal to cubic and variations in electrical properties takes place at this temperature, where the K factor max. is observed. (Mme. Curie found similar effects on other substances.)

It is usually the aim to produce HK dielectrics which exhibit a low enough TC_c and max. K at the most likely encountered operating temperature range. Many thousands of titanate and oxide mixtures have been tested and scores of patents have been claimed since 1942 to find the best compromise between K, TC_c and other properties.

POWER FACTOR

LK: We have seen that different dielectrics result in different capacities, and it was mentioned that the K factor is affected by many other effects and operating conditions. It is, therefore, not surprising that the fast-charging and discharging cycle does not happen without loss of electric energy, when a.c. is applied, with the associated energy transfer via the electric field in the dielectric. In the extreme case, as in high-power radio transmitters, the dielectric is warming up or may even become hot.

The percentage of lost r.f. energy is expressed as %P.F. (P.F. = 1 ÷ Q, where Q is the Quality Factor). Electrical energy becomes heat due to dielectric losses, which depend on the ceramic, the operating temperature and frequency, the r.f. power load, the electric and heat conductivity of the electrodes and terminals, the ambient temperature, duration of operation, and the TC of the P.F.

In receivers, the P.F. affects the gain and selectivity and, in this way, we can measure the P.F. as $\Delta f/fr$ (tuned circuit bandwidth divided by resonance frequency).

Low capacity values, as those obtained with LK ceramics, are required in tuned circuits and, therefore, LK dielectrics should have an extremely low P.F. of 0.01 to 0.05% at 1 Mc. The TC of the P.F. should be low also, to make the LK bodies suitable for transmitter capacitors, where an r.f. load of 60 kva. at 3 Mc. may be acceptable for a well-assembled 3" diameter plate capacitor of 650 pF. The 25°C. P.F. should not double below 120°C. Even porous ceramics can have a low P.F. if we can keep the air humidity out and do not apply high voltage. There may be an application for these too.

HK: HK ceramic capacitors are usually only required in electronic equipment where the P.F. of 0.5 to 2.5% has no detrimental effects, as in by-passing and coupling applications. It is interesting to note that the TC of the HK P.F. is negative up to the usual operating temperature, but, at 150 to 250°C., we observe the usual increase so well known from other dielectrics. Most ceramics have a decreased P.F. at higher frequencies, but HK bodies make an exception sometimes.

INSULATION RESISTANCE

The dielectric has the purpose of assisting the storing of the electric charge and, therefore, it is important to have an I.R. as high as possible to reduce the leakage current through the dielectric. Ceramics are now being made with an I.R. of 10^{15} ohms per cm., but we usually accept 10^{10} ohms as satisfactory.

It is a big problem to find coating materials to protect the surface which are usable from a practical viewpoint, to retain the good I.R. under practical operating conditions.

Only at operating temperatures in excess of 200°C. does the I.R. become critical again. This is different, of course, in the case of extremely thin oxide films used as dielectric skin on semiconducting ceramics. The I.R. increases due to polarisation as the measuring time is increased. If temperature variations cause stress in HK samples, the piezoelectric effect can make a reliable I.R. measurement impossible.

AGEING AND RECOVERY

After firing or any heating cycle, the crystal structure has the tendency to relax and reduce internal stress. It is not surprising that, during this period also, the electrical properties change. This so-called ageing process is particularly evident in the case of HK ceramics and the degree of ageing is usually greater as the K factor increases. The I.R. increases whilst the K factor and P.F. decreases. The ageing seems to go on faster if the ceramic HK capacitors are kept at low temperatures, and stops at the Curie Point temperature. At higher temperatures, we observe a more or less pronounced recovery of the capacity. In most practical cases, TC_c, ageing and recovery are superimposed effects and we can only measure the ageing alone if we keep the capacitors at a constant temperature all the time.

The ageing rate is usually constant per time decade, e.g. 3% each during the first, the next 10, the next 100 and 1,000 days, which would amount to 12% K loss in three years. However, ageing is not a material constant either because a 0.008" thick K : 9000 sample may age three times faster than a 0.035" thick sample. The higher we heat the capacitor above the Curie Point (50, 150, 800°C.), the more complete is the capacitor's recovery, but the new ageing cycle commences immediately during the cooling down time.

POLARISATION

The application of a high d.c. voltage to the electrodes of HK capacitors causes various properties to change. The I.R. measured after 1 minute may rise to three times this value after 2 minutes and may, again, double in 10 minutes. Electrolytic capacitors, which rely on polarisation, behave in a similar manner.

With a low voltage (a.c. measuring voltage plus polarisation voltage) of about 2 V. per 0.001" dielectric thickness, we usually measure maximum capacity, but the application of a higher field strength causes, at first, a steep and, finally, a less severe capacity loss. This loss of K becomes most effective at Curie Point temperatures and tends to reduce the TC_c. A permanent K loss of 10 to 40% occurs if the polarising field strength becomes too high.

300v. on K : 9000 0.010"
(breakdown at 1500v.)
700v. on K : 2500 0.010"
(breakdown at 3000v.)
50v. on K : 4000 0.0005"
(breakdown at 500v.)

By heating up to 100°C., we nearly restore the original capacity value. Strange properties will be found if a high operating temperature and a high field strength are used together. The a.c. measuring voltage has a substantial effect, also. 2v. r.m.s. per 0.001" dielectric thickness often gives maximum capacity, whilst 0.1v. may result in only half the capacity being measured. Reversing the polarity after an I.R. measurement causes at least initially a much lower I.R. when measured again. The working voltage limit of oxide skin dielectric (0.0001" to 0.002" skin thickness) is determined more by the capacity loss, with voltage applied, than by the danger of breakdown.

IONISATION, BREAKDOWN, NOISE

Ceramic dielectric bodies are an irregular mixture of crystals. None of the many production processes or commercial grades of raw materials will give a structure which is void free. When the body vitrifies, some voids will remain which trap furnace gases. In the case of the capacitor, these voids will be subjected to high field strengths, especially if the K factor is high, and ionisation, as in a neon light, can take place. We are usually able to observe that the P.F. is gradually increasing with several h.t. flash tests, especially if we reach 100 to 200v. per thousandth thickness. Eventually, the dielectric will break down and become punctured.

Before this happens, we can make the ionisation audible with the help of a suitable apparatus. If we apply r.f., we may need only 1v./thou. to obtain noise, also called scintillation. These faulty or overstressed dielectrics can cause noise in receivers and instability of oscillators. Generally speaking, dielectrics can withstand quite high voltages:

0.006" N.P.O. .... 7-8 kv. d.c.
HK oxide skin 0.0005" 500-800v. d.c.

The ceramic processes play, also, a vital part. The working voltage has to be kept below the ionisation level.

(Continued on Page 20)

SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R.," and back copies may not be available upon request. To preserve continuity of your files of "A.R.," please pay your annual subscription now.

A STABLE TRANSISTORISED V.F.O.*

COMMANDER PAUL H. LEE, W3JHR

● Here is a v.f.o., using two transistors and ARC-5 components, that is so stable that it may be considered a "synthetic rock". Since it is made primarily from ARC-5 parts, it is very economical.

ALMOST everybody reads the "Bulletin," says the familiar ad, in Philadelphia. And likewise, almost everybody on the Amateur bands has a v.f.o. these days, except rock-bound Novices, of course. However, their day will come, and this article should be of interest to them also.

Most home-made v.f.o's. and some commercial models (including those in transmitter units) suffer from "drift-itis," a disease whose severity is proportional to the patient's temperature. Much has been written by knowledgable authors on the subject of v.f.o. frequency stability, but unfortunately no one has yet been able to divorce the heat-producing vacuum tube from its connection to a tuned circuit which is supposed to maintain stability. This would be a neat trick if one could do it!

With the advent of semiconductors in plenty, however, there is promise of real progress in the field of stable frequency generation with very simple circuitry within reach of the Amateur pocketbook. The v.f.o. described here is my own answer to that requirement. Impetus was added to my motivation by the necessity of operation on Navy M.A.R.S. and Naval Reserve frequencies outside the Amateur bands with adequate stability (0.003% tolerance), which previous vacuum tube v.f.o's. did not do.

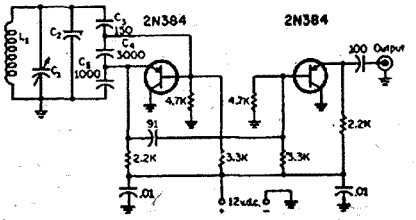


Fig. 1.—Circuit of the "Synthetic Rock" v.f.o. The tank circuit components, L1, C1, and C2 are ARC-5 oscillator components, the values of which are dependent upon the ARC-5 chosen and the frequency desired. All resistors are ½ watt, all capacitors greater than one in value are in pF., and less than one in value are in μF.

CONSTRUCTION

This transistorised v.f.o. is extremely simple to build, and is quite inexpensive. In a previous issue of "CQ,"[1] I described a v.f.o. built from a cut-down ARC-5 command set. For those who do not have the back issue, the ARC-5 chassis was cut just ahead of the oscillator section, the front panel was moved back, the amplifier tuning capacitor, with its dial, replaced the oscillator capacitor, and the ARC-5 oscillator components were used in a vacuum tube circuit.

The same mechanical concept is used in the transistorised v.f.o. described here, but the process of "cutting down" is carried to the extreme by stripping out all the wiring and components except the oscillator tuning capacitor below the chassis, and the coil and padding capacitor above the chassis.

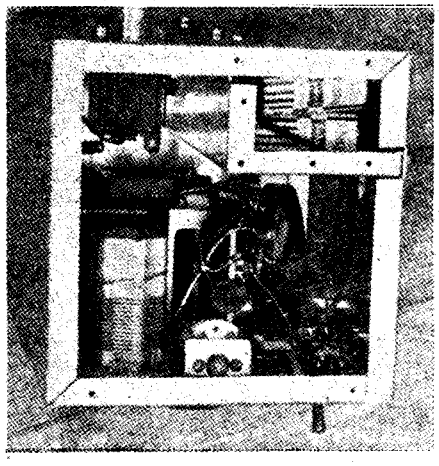
Two 2N384's are mounted on terminal strips beneath the chassis, and with the addition of a few capacitors and ½ watt resistors, plus a coaxial connector and two batteries, the unit is wired up as shown in Fig. 1. The two Z4 6-volt batteries in series provide the 12 volts power for the unit. Eight No. 1 flashlight cells can also be used in series, and will fit in the space at the rear of the chassis.

STABILITY

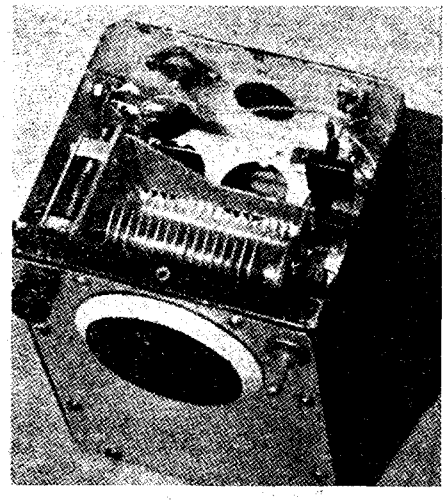
One of the secrets of the excellent frequency stability of this unit is the fact that the oscillator transistor is connected across a relatively low impedance (C4 and C5), and is quite loosely coupled to the tuned circuit through the voltage divider action of C3, C4, and C5. This effectively removes the transistor from the frequency determining tank circuit itself. In fact, C3 could be made even smaller if desired. Its lower limit would be that capacity which still permits the circuit to maintain oscillation.

This circuit is the result of much trial and error. Many published circuits involve connection of the transistor across high tank circuit impedances, resulting in a peculiar instability which manifests itself as a low frequency rumble or burble on the signal. It was actually an irregular frequency shift of only a few cycles (perhaps less than five cycles) about a very stable mean frequency, but the frequency could be seen as a fluctuation of the receiver S-meter. The long-term frequency stability was excellent, but the burble was there due to making the transistor look into too high a tank circuit impedance.

The 2N384s work very well in the circuit shown here. The emitter-follower buffer provides excellent isolation from anything that follows that stage. The v.f.o. can of course be designed to work on any frequency you wish. In my case I use it on 4.9-6.1 Mc. to provide the injection frequency for the s.s.b. exciter.[2] It drives the 6AH6 which formerly functioned as the L.M. v.f.o. doubler in the exciter. It is connected to the transmitter through 10 feet of RG-8/U cable. The 2N384 is so stable in this oscillator circuit that it could actually be keyed on and off for c.w. by merely opening the 12 volt battery lead, with no chirp or frequency instability!



Bottom view of the transistorised v.f.o. built around an L.M. tuning capacitor and housed in a 6 x 6 x 6 inch cabinet. The battery compartment at the rear holds eight No. 1 flashlight cells. An ARC-5 coil form is used for L1 for improved stability.



Bottom view of the transistorised v.f.o. built on a cut-down ARC-5 chassis. A false front panel is used to cover the extra holes. The r.f. output jack can be seen in the rear left corner.

This v.f.o. has been in use at W3JHR for four months as of this writing. The batteries were replaced once, at the end of three months, when their combined voltage dropped to 7 volts under load (a few milliamperes!). This included several periods of being left on all night in error. The only noticeable effect of the low voltage was a slight decrease in output. Use of a pilot light, while desirable from the standpoint of showing the "on" condition, would run the batteries down much more quickly, so it was omitted.

The v.f.o. is used when operating on the Navy frequency of 4015 kc. and it keeps me on frequency with better

(Continued on Page 20)

* Reprinted from "CQ," September 1963.

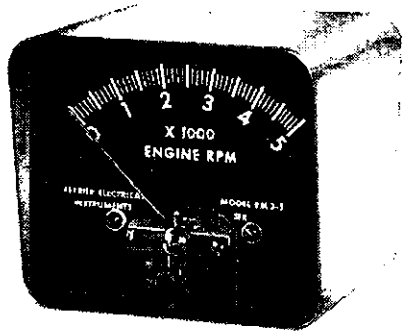
[1] Lee, Paul, "Low Cost V.f.o.," "CQ," July 1955, page 33.

[2] Lee, Paul, "Crystal Filter Type S.s.b. Exciter," "CQ," November 1961, page 32.

featured in

Outlook

TACHOMETER
(Vol. 6, No. 5)



This versatile electronic tachometer may be operated with internal combustion engines with 4, 6 or 8 cylinders and 6V or 12V, positive or negative earthed, electrical systems. Whilst this tachometer was primarily designed for use in motor vehicles, it may also be used with marine engines having battery ignition.

MULLARD STEREO "TEN-TEN"
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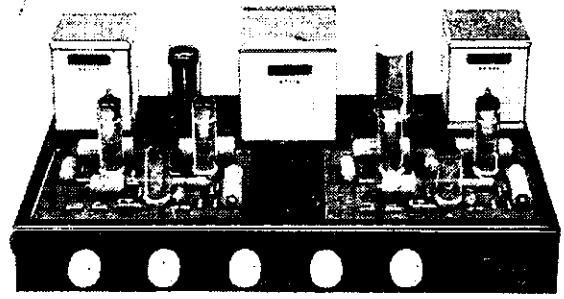
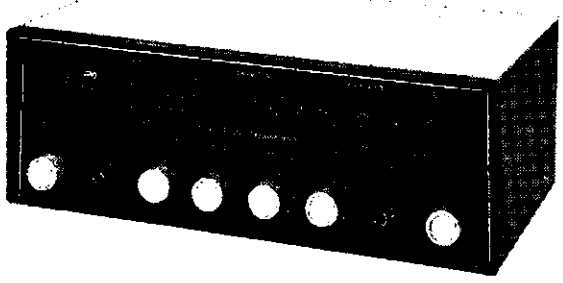
(Vol. 5, No. 4)



High quality sound reproduction is achieved in this Amplifier with a complement of two 6GW8/ECL86 valves and one low-noise AF pentode type EF86 in each channel. A 5AR4/GZ34 rectifier in the power supply is common to both channels. Peak power output is in excess of 10W per channel. The total harmonic distortion (10W output) is less than 0.1%, a typical value being 0.05%.

WIDEBAND TUNER STEREOPHONIC PRE-AMPLIFIER
with printed wiring boards
(Vol. 6, No. 3)



This unit contains a Wideband AM tuner with a selectable bandpass, together with a four-valve stereophonic pre-amplifier. Although primarily designed for the Mullard Stereo "Ten-Ten" Amplifier, this unit may be used with most other high quality amplifiers.

First published in 1958, and originally intended as a means of communication with the Industry, Mullard Outlook circulation has increased year by year. It is now in great demand, not only within the Industry, but with teaching establishments, home constructors and enthusiasts alike.

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EARTHING

RALPH W. BIRRELL, VK3ZNE*

EARTHING or grounding is very important in electrical installations yet the reasons for earthing are often not clearly understood even by some electricians. A Ham Station is an electrical installation and must comply with the wiring rules for such installations. These rules are now uniform over Australia, even if given different titles in different States, as they are based on the Standards Association of Australia Wiring Rules A.S. No. CC1 Part 1, 1961.

Rule 501a states that all equipment except double insulated must be earthed (double insulation is used mainly on power hand tools such as drills; all live metal parts being covered with at least a double layer of plastic insulation). There must be a main earthing conductor from the earth connection at the main switchboard to the water pipe or other earth electrode, the minimum size of this wire is 7/.036. In house wiring, earth wires then run from the earth connection at the main switchboard to the earth pins of 3-point plugs with minimum size 3/.029. The connection of this wire must be done by a licensed electrician.

This appears straightforward, but there is one catch. Many three-pin plugs have been installed under older regulations without any earth connection between the three-pin plug and main switchboard. Using a three-core flex with earth wire may be useless if there is no earth wire from the plug base to the main switchboard. A check should always be made on any three-pin plug base to see if there is an earth wire connected.

Gas pipes and sprinkler pipes must not be used for earthing. A water pipe would appear to give a good earth but this can only be relied upon if the shack is on damp earth or clay and the pipes are below the water table. Many parts of Australia are rocky and dry and earthing of water pipes can be a real problem. If fibre pipes are used for the water supply no reliance can be placed on the water pipe as an earth.

I feel that the only safe way is to install a station earth bed completely independent of the water supply pipes and to earth all exposed metal parts in the station to this earth bed. Large scale earth beds are made by burying cast iron pipes in wet coke with the earth conductor being solidly bolted to the pipes. A simpler method is to drive one or more copper rods into the ground at least four feet. Galvanised ¾" water pipe will be equally as good if at least 4 feet long. The more rods or pipes in parallel, the lower the earth resistance, and the pipes should be spaced at least one foot apart and connected to each other with 7/.029 copper wire.

The earth wire should be terminated with a Ross Courtney and bolted to the pipe or connected to the pipe with an electrician's earthing clamp. The connection should be made and then painted to prevent corrosion and should be scraped and repainted at least every 12 months. The earth bed should be in the open and should be kept damp. All soils dry out in summer and this causes a rapid rise in earth resistance.

* C/o. Technical College, Bendigo, Vic.

TEST AFTER INSTALLATION

A simple and reasonably accurate method of testing the earth bed is to use the fall of potential method.

Alternating current is circulated through the earth G and a fixed test earth G1 (see Fig. 1). A high resistance voltmeter is connected to G and to a movable test probe P. P is moved along a line from G to G1 and voltmeter readings taken simultaneously with ammeter readings.

$$R = E \div I$$

Values of R are plotted against distance and the flat part taken as the earth resistance.

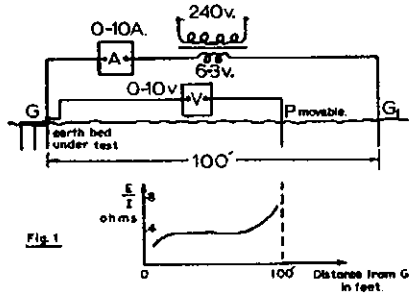

Fig. 1

LIGHTNING PROTECTION OF ANTENNA TOWERS

Towers should have a pointed spike or finial projecting at least 3 feet above the top of the antenna, with an earthing conductor running from the finial to a separate earth. The wiring rules require the use of a separate earth at least six feet from any other earth connections. Lightning currents may be many thousands of amps. in magnitude, but they are pulses of very short duration, so the heating effect on the conductor is usually small. A 7/.029 copper earthing conductor should be ample.

REASONS FOR EARTHING

This discussion applies to the multiple earthed neutral (M.E.N.) system.

Where the user of the electrical equipment with exposed metal parts cannot earth himself, that is, he is in a room with dry wooden floors with no water pipes or other earthed metal within reach, there is no need to supply an earth on the equipment. However, this situaion seldom occurs in practice and every station should be treated as an earthed situation.

Rule 522b states that the resistance of the conductor from the earth electrode or water pipe shall not exceed 2 ohms. This is easily obtained with stranded copper earth wire, but care should be taken if cast iron forms part of the conductor circuit as cast iron may have quite a high resistance.

Rule 556 lays down that the resistance of any earth electrode shall not exceed 200 ohms.

I feel that for safe operation an overall resistance of not more than 4 ohms for the earth bed is absolutely necessary. In a normal house a 30 amp. or 45 amp. fuse is connected in the main switchboard feeder from the street pole and a 15 amp. fuse or smaller to the sub-circuit. The neutral return wire is bonded to earth at both the sub-station transformer neutral and the main switchboard with the earth providing an alternative path back to the transformer if the neutral wire becomes disconnected.

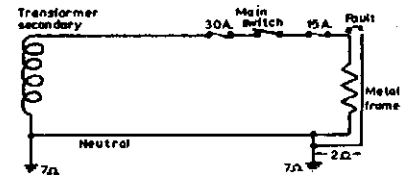

Fig. 2

Consider the circuit as shown in Fig. 2 with the neutral wire connected normally. If a fault occurs between active and frame, the current will be 240 ÷ 2, that is 120 amps., and the 15 amp. fuse will blow. Now suppose for some reason the neutral wire no longer is in circuit and all current must return through the earth. If the earth resistance is 7 ohms at the house and at the transformer, then the current is 240 ÷ (7 + 7 + 2), that is 15 amps., and the fuse will just blow. Any higher resistance than this and the fuse will never blow. The metal casing of the rig will be at 240 volts to earth.

We have neglected the resistance of the active between transformer and appliance, the resistance of neutral between appliance and transformer, and the resistance of the earth itself, about 0.09 ohm per mile, and secondary reactance. If these are considered, the fault current will be smaller than 15 amps.

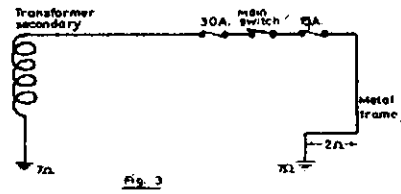

Fig. 3

Considering the unknown resistances and reactances, it seems to me that a maximum resistance between electrode and earth of 4 ohms should be the aim to make the installation safe under conditions likely to be met in practice.

The lower the earth resistance the more likely the 15 amp. fuse is to blow and disconnect the supply to the rig and remove the possibility of the exposed metal being at 240 volts to earth. The danger of putting a heavier fuse

(Continued on Page 17)

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SOME NOTES ON THE USE OF R.F. CHOKES*

R. G. CHRISTIAN, A.M.I.E.E., A.M.Brit.I.R.E., G3GKS

THE radio frequency choke is an extremely useful component which makes its appearance in a wide variety of circuits. In fact in some cases the operation of the circuit is vitally dependent on the use of one or more r.f. chokes although the chokes may have little effect on the design of the circuit and as a result tend to be regarded as of little consequence. This viewpoint is in some instances an incorrect one, particularly where the choke is regarded as an anode load when in fact it is not acting as such.

The purpose of this article is to examine whether the choke is being effectively used. In doing so the writer hopes to explain the reason for a complaint, often heard, that the multiband exciter or driver unit being used fails to provide sufficient drive on 10 metres whilst operating quite satisfactorily on the lower bands. The requirements of harmonic amplifiers for frequency calibrators are also discussed.

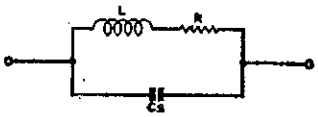


Fig. 1.—Approximate equivalent circuit of an r.f. choke.

THEORY OF R.F. CHOKES

The r.f. choke is wound to provide a certain inductance, usually of the order of several millihenries for medium frequency use. The winding resistance is generally rather large compared with that of a tuning coil, with the result that the Q-factor is on the small side, but unless the choke is to be used as the inductance element in a tuned circuit, this low Q is not a disadvantage. The choke inevitably has some self-capacitance which may be minimised by winding it in several sections of "pies" so that the stray capacitance is effectively made up of several smaller capacitances in series. The stray capacitance is really distributed throughout the winding but for simplicity may be regarded as consisting of a "lumped" capacitance. The r.f. choke, shown in a circuit diagram as a pure inductance, is in fact acting as a circuit consisting of inductance L and resistance R, in parallel with a capacitance C_s, as in Fig. 1. Some measurements made on a nominal 1.5 mH. choke of well known make showed that L was in fact 1.5 mH., C_s was about 1.4 pF. and the Q ($= \omega L/R$) varied from 16 at 180 kc. to 3.5 at 400 kc.

At very low frequencies the choke behaves very nearly as a pure inductance and produces a reactance of ωL which increases with frequency. The actual reactance is modified by the presence of the capacitance C_s and, to a much smaller extent, the resistance R. Neglecting the effect of the resistance, the effective inductance is modified from L to L^1 such that $L^1 = L/(1-\omega^2 LC_s)$. In other words the effective inductance increases with frequency due to the stray capacitance. As the frequency is increased, however, the inductive and capacitive reactances will become equal (neglecting R), so producing parallel resonance. The parallel resonant frequency is given by $f_o = 1/(2\pi\sqrt{LC_s})$. In the case of the example quoted above, since L = 1.5 mH. and C_s = 1.4 pF., the self-resonant frequency works out to 3.5 Mc. and this value was confirmed by actual measurement of f_o.

Above this self-resonant frequency the choke behaves as a capacitance of very small value but of course its reactance decreases with frequency. Due to the fact that the self-capacitance is really distributed, there is a possibility of self-resonance at several other frequencies. These may not cause ill-effects provided they are parallel resonances but it is possible for the capacitance of one part of the coil to produce series resonance with the inductance of another part. Since a series resonance provides a low-resistance path and as the duty of the choke is to provide a high impedance, it follows that such resonances are to be avoided if possible, particularly in the bands being used.

For the purposes of this article, it will be assumed that only one simple parallel resonance exists. If this is so, then at frequencies well above f_o the choke will behave effectively as a capacitance C_s with a reactance $1/\omega C_s$. Most of the foregoing theory assumes that the choke is in complete isolation, whereas in practice it must be considered as part of the circuit in which it is used.

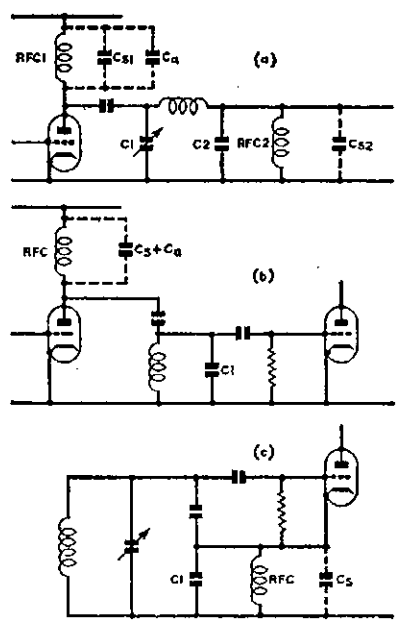


Fig. 2.—Effective use of r.f. chokes. (a) Power amplifier with pi-coupler; (b) Choke coupled tuned load; (c) Colpitts oscillator.

EFFECTIVE USE

Three examples of the effective use of an r.f. choke are shown in Fig. 2. In every case the choke is used to provide a d.c. path for the valve and in the case of Fig. 2(a) and (b) also provides a means of coupling the load to the valve. In any valve there will be stray capacitances associated with both grid and anode together with stray wiring capacitances. These capacitances may be considered, along with the self-capacitance of the choke, as part of the tuning capacitance C1 in Fig. 2(a) and (b) and may in general be ignored on the assumption that C1 is much larger than the total stray capacitance.

The choke behaves in these circuits as a low resistance path to d.c. and as a high inductive reactance at the frequency of operation. For example, our 1.5 mH. choke has an inductive reactance of about 270K ohms on 10 metres and since the load connected to the anode of the valve consists of a resonant circuit having an effective resistance much less than 270K ohms, the choke has practically no effect on the circuit. The same is true of the second choke RFC2 in Fig. 2(a), the stray capacitance effectively forming part of C2 in the pi-network. Again in Fig. 2(c), the choke provides a d.c. path for the valve whilst its stray capacitance is effectively part of C1.

INEFFECTIVE USE

A common use of the r.f. choke is in the circuit of Fig. 3 which could be an amplifier or the anode circuit of an electron coupled oscillator. The choke provides a d.c. path for the anode current of the valve but it does not constitute the a.c. anode load. This is because of the stray capacitances C_s, the stray capacitance of the choke (C_s), the output capacitance of V1 (C_o), the input capacitance of V2, and C_w the capacitance due to wiring and proximity of components, etc. If V1 and V2 are pentodes, the total stray capacitance ($C = C_s + C_s + C_o + C_w$) may have a value of between 20 and 40 pF. which may be considered as being effectively in parallel with the inductance L of the choke. The anode circuit will have a parallel resonance at $f_o = 1/(2\pi\sqrt{LC})$ so that if L = 1.5 mH. and C = 30 pF., then f_o = 0.75 Mc. which is well below any of the Amateur bands.

Below this frequency f_o the anode load is inductive having an effective reactance of $\omega L^1 = \omega L/(1-f^2/f_o^2)$ if we ignore the resistance of the choke. At frequencies higher than f_o the anode load is capacitive and has an effective reactance of approximately $1/\omega C$. The important conclusion we reach is that the anode load decreases as the frequency increases. Now the gain of V1, as a linear amplifier at least, is given approximately by $A = g_m/\omega C$ which means that the gain is inversely proportional to frequency. In other words the gain is halved each time the frequency is doubled. For a value of

* Reprinted from "R.S.G.B. Bulletin," October, 1963.

C = 30 pF. the anode load is roughly 1,400 ohms at 80 metres and falls to only 180 ohms at 10 metres.

Bearing in mind there is no resonance in the bands used, or so we assume, there can be no flywheel action as in a tuned class B or C amplifier, hence the output from V1 is going to decrease with frequency and could well be too small on the highest frequency bands. This effect could be the reason why very often a multiband driver stage using a choke in the anode circuit will not provide sufficient drive on 10 or even 15 metres, yet gives ample drive on the lower frequency bands. If this occurs, one possible solution might be to attempt to reduce the stray capacitances by changing component layout and by replacing V2 with a valve having a smaller input capacitance. It should be remembered that if V2 is made up of two valves in parallel, as is often the case with a p.a. stage, then the input capacitance is doubled. Substituting one larger single valve may be effective in reducing C_k. Should these methods fail to give sufficient drive probably the only solution is to replace L in the driver V1 by a suitable tuned circuit or wideband coupler. Replacing L by an r.f. choke of larger inductance will generally make the situation worse since a larger choke is likely to have a larger self-capacitance.

HARMONIC AMPLIFIERS

The circuit of Fig 3 is often seen in crystal calibrators where it may form the output circuit of the crystal calibrator or it may in fact represent a buffer or harmonic amplifier. The amplitude of the harmonics generated by an oscillator or amplifier tend to decrease with increasing order of harmonic, e.g. the amplitude of the twenty-fifth harmonic tends to be weak compared with that of, say, the fifth. Now if the harmonic output is fed into a circuit of the type represented by VI in Fig. 3, then the harmonic amplitudes will be further reduced relative to each other because the gain of V1 is inversely proportional to frequency.

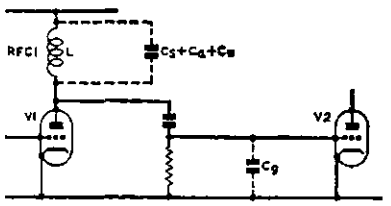


Fig. 3.—Ineffective use of r.f. choke as a.c. load.

It is convenient to consider a square wave applied to the grid of V1 because such a wave contains harmonics whose amplitudes decrease inversely as the order of the harmonic. In other words, the fifth harmonic has five times the amplitude of the twenty-fifth harmonic. Since the gain of VI is inversely proportional to frequency, it follows that in VI our fifth harmonic is amplified five times as much as the twenty-fifth which is already only one fifth as strong as the fifth. Thus at the anode of VI the fifth harmonic is now 25 times as strong as the twenty-fifth. Obviously the characteristic of V1 is not the best one, because weak harmonics are being made weaker relative to the strong ones.

What is required of V1 is that the gain should increase linearly with frequency so that at the anode of V1 the fifth and twenty-fifth harmonics have equal amplitudes. Even if the input to VI is not a square wave, it will still be a wave in which the harmonic-amplitudes decrease with order of harmonic and again the ideal gain characteristic of V1 is one that increases with frequency. One possible solution would be to reduce the value of L to a small value so that resonance with L and C occurs at a frequency higher than the highest harmonic required. For example if C = 30 pF. and the highest harmonic required is 30 Mc., then L could have a value $L = 1/\omega_0^2 C = 9.4\ \mu H$. However, at low frequencies the reactance of L, and hence the anode load, is so small that the gain of the stage would be very much less than unity, e.g. at 1 Mc. the 9.4 μH. inductance has a reactance of only 59 ohms and if V1 had a mutual conductance of 10 mA/V the gain would be 0.59. This gain of course increases with frequency and at 20 Mc. for example would be about 20 times as large. If such a system is used the stray capacitance C should be kept as small as possible so that L may be made as large as possible.

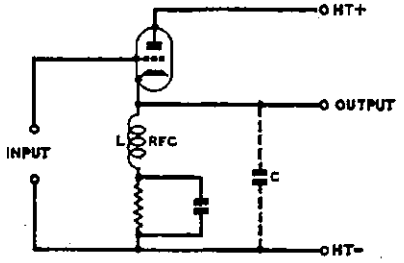


Fig. 4.—Cathode follower harmonic amplifier.

An alternative idea would be to use a cathode follower with a choke as the load as in Fig. 4, since the gain of a cathode follower is less affected by variations in load impedance and hence frequency than that of the common-cathode circuit of Fig. 3. The cathode load now consists of the choke in parallel with stray capacitances but these strays will be smaller than those in Fig. 3, thus the decrease in gain will be moderate. It should be borne in mind that the voltage gain of a cathode follower is always less than unity due to the entire output voltage being fed back in series with the input producing 100 per cent. negative feedback. However, the power gain is much greater than unity due to the very high input and low output impedance. Since the circuit in this application will generally be feeding low impedance loads such as the aerial input of a receiver for example, the fact that the voltage gain is less than unity will not be a serious disadvantage. The choke could of course be replaced by a small inductance as suggested previously for Fig. 3 in which case moderate compensation for the fall in harmonic amplitude would be achieved.

Inductive compensation as used in wideband amplifiers and the use of delay-lines as in distributed amplifiers are aimed at producing a level response, as opposed to a rising characteristic and are outside the scope of this article.

In concluding, the writer hopes that this article will induce some second thoughts about the much neglected r.f. choke and that consequently this essential component will merit a little more attention in circuit design. ●

☆

HINTS AND KINKS

BETTER HEAT RADIATING TUBE SHIELDS

K9APE suggests that HX-30 owners boil the tube shields of all the tubes, except the one for the 6360, in salt water. This blackens the shields and increases their ability to radiate heat, thus extending tube life. I tried the scheme and found that I now can touch the driver tube of my HX-30, which I could not do before the salt water treatment.

—Reprinted from "QST," Oct. 1963.

SHIELD CAN SOURCE

Fluorescent light starters have aluminium cases which make excellent miniature shield cans. The shields measure 13/16 inch in diameter and about 1¼ inch in length. Four tabs at the open end of the shield can be run through the chassis and bent for mounting.

—Reprinted from "QST," Oct. 1963.

"QRX! The V.f.o's. drifting again."

A.N.A.R.E. BASES

Most Amateurs are now familiar with the fact that the A.N.A.R.E. has several bases in the direction of the South Pole from Australia. Most would also be well aware that Amateur Radio call signs for such locations used the prefix VK1 for some years until the current VK0 replaced the former. But how many can remember the year in which each of the A.N.A.R.E. locations "opened shop"?

To refresh your memory, in case you have forgotten, here they are:

1947—Heard Island and Macquarie Island.
1954—Mawson Base.
1956—Davis Base.
1958—Wilkes Base.

Heard Island closed operations in 1955.

Davis Base is 400 miles east of Mawson Base, and Wilkes Base is 1200 miles east of Mawson Base.

—WIA-L3042/BERS195.

6-METRE A.M. TRANSCEIVER

RUSS HARDIDGE, VK3ZRH*

THE rig to be described here runs eight watts to the plate of a 12BY7 to give an r.f. output of 4 to 5 watts—suitable for most local working and also some DX if the band is open and a reasonable aerial (and QTH) is available. The sensitivity of the "rush box" receiver is ample for local work when operating portable or mobile.

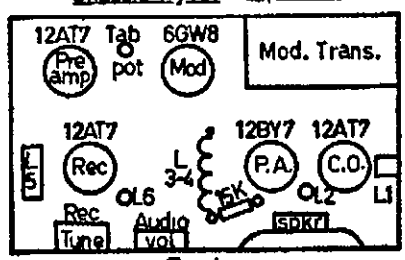
It was originally intended to use the transceiver for operation on the 6 metre a.m. net frequency of 53.032 Mc. for portable and mobile use and also possibly for W.I.C.E.N., however results with the transmitter have been so heartening it is also used as the shack transmitter in conjunction with a home-brew superhet receiver. For use in the shack the regeneration control is simply turned off and a jack inserted in the earth lead of the T-R switch and connected to the normal relay system in the shack.

The original transceiver used trimmers to tune the final tank and adjust the antenna loading because fixed frequency work only was intended. However if shack use is intended, normal variable capacitors of about 50 pF. maximum capacity with the controls brought out to the front panel would be preferable. V.f.o. can be used, utilising the present overtone circuit as a doubler or tripler (**not** straight through) if the junction of the 47 pF. and 0.001 μF. capacitors is earthed.

* 21 Mitcham Road, Donvale, Vic.

The modulation transformer is a standard single-ended speaker transformer with primary 7K (to 12BY7), tapped at 5K (to 6GW8) primary (common to B+), to 3.5 ohm secondary. This gives a much better impedance match than the normal centre tapped transformer or with choke modulation. The current drawn on transmit is in excess of the manufacturer's figure of 50 mA., but the A. & R. transformer type 2624 used in the original has shown no signs of panic. With modulation, the current cancelling effects of the auto transformer configuration helps to prevent any breakdown.

Chassis layout Top view.



A crystal mike was used purely because of personal preference, however a carbon mike could be used in the normal manner with the saving of one tube; alternatively, the unused half of the 12AT7 could be used as a tone generator. Do not bypass the cathode of the 12AT7 pre-amp. unless you particularly want r.f. feedback.

With the screen bypass used, the 12BY7 should not need neutralisation, but do not forget to check; inductive neutralisation from plate to grid would probably be the easiest method. While the final was quite stable, 12BY7s have been known to take off when used straight through on 50 Mc. A brass plate across the socket, between plate and grid lugs, should cure this if it should occur.

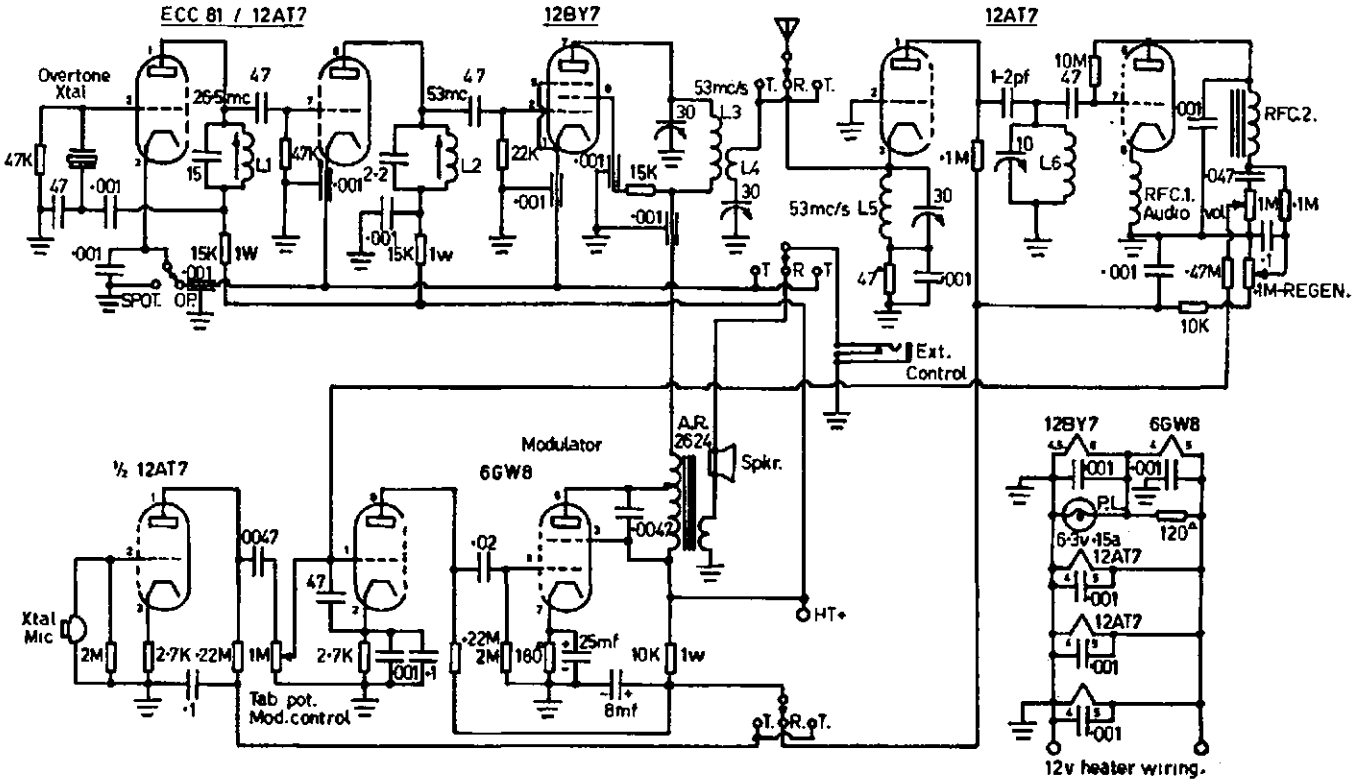
LAYOUT

All components except modulation transformer, screen dropping resistor, final tank, speaker, T-R switch, regeneration control and, of course, all tubes, are below the chassis.

The only precautions are to make sure that tuned circuits likely to cause feedback are at 90° to each other, and that hot audio leads are shielded. There was some acoustic feedback when switching from transmit to receive in the original which was cured by using a switch on the mike. Removal of the r.f. bypass in the plate lead of the audio preamp. would prevent this, but may accentuate r.f. feedback—this is a matter for experiment.

ALIGNMENT

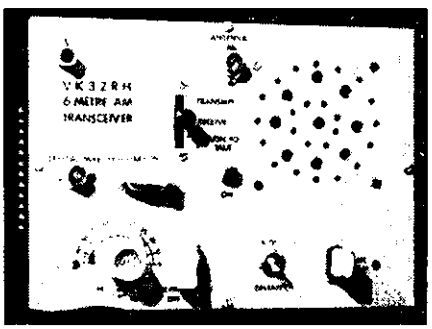
Transmitter: All coils were first grid dipped (dip the overtone coil approx. half a megacycle higher than crystal



frequency), then driver coils were adjusted for maximum grid drive to the 12BY7 (approx. 2 to 3 mA., depending on crystal; at least 1½ mA. required for good modulation).

The final tank and loading were adjusted for maximum power up the stick—more satisfactory than tuning for minimum dip and then loading with this particular bottle. Plate current should be around 27 mA., screen current 6 mA. Adjust screen dropping resistor if necessary to allow 180 to 200 volts on the screen with 250 to 300 volts on the plate (measure with v.t.v.m. or high resistance voltmeter).

Modulation level is adjusted with a c.r.o. or until plate current just kicks upwards on peaks. The unit is capable of excellent modulation when properly adjusted.



Receiver: Grid dip the r.f. amp. coil to 53 Mc., or adjust for maximum gain. Grid dip the detector coil to 54 Mc. with minimum capacitance (or use a signal generator), then adjust number of plates on capacitor if necessary to tune down to 50 Mc. Tuning is quite broad and only a 4 to 1 vernier (scrounged from a transistor portable) was used in the original and found quite satisfactory. Adjust coupling "gimmick" (two pieces of hook-up wire wound together, or trimmer if more capacitance needed) for maximum sensitivity together with smooth regeneration. Maximum sensitivity, and selectivity, is right on the threshold of regeneration.

Spotting switch is for use with the main shack receiver and v.f.o.

COIL DATA

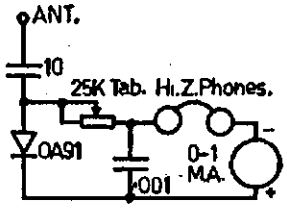
L1—10 turns 27g. close wound on Aegis 5/16" slug-tuned former.
L2—6 turns, as above.
L3—6 turns 10 or 12g. ½" i.d., half diam. spacing.
L4—2 turns hook-up wire over cold end of L3.
L5—6 turns 18g. ¼" diam., ½" long.
L6—6 turns as L1.
RFC1—Quarter wave length of 27g. on 5/16" former.
RFC2—Anything from 2.5 to 100 mH. choke.

AFTER-THOUGHTS

Power requirements are for 250 to 300 volts h.t. at around 100 mA. Either 6 volt or 12 volt wiring can be used. 12 volt was used in the original to allow for mobile work.

Chassis was aluminium, 8" x 5¼" x 2". The case was steel, louvred ends, 9" x 7" x 5½".

The receiver, like all super-regens., will radiate, but tests running it on the bench alongside the shack receiver show that radiation is not significant.



Tuning meter & Monitor.

TRANSISTORS

A transistorised version of the above is currently being constructed and will be described when final testing is complete. It is expected to run about the same power to push-pull AUY10s. It is intended to make this in two parts; a hand-held section running around 500 mW. for short haul W.I.C.E.N. work, and a linear final running about eight watts for installation in the car or for base station use.

Answers to any queries on the 6-Metre A.m. Transceiver or the transistorised version will be gladly given on the air or on receipt of a s.a.e.

ACKNOWLEDGMENTS

The following articles are acknowledged as providing various ideas incorporated in this design: "VK7 144 Mc. Communicator, "A.R.": "Compact Six Metre Transceiver," W3KET and W3TND. "Electronics World," April 1963.

Also thanks to all the six metre VK3 regulars for their helpful assistance on the air, with particular thanks to Jack VK3ZPG.

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EARTHING

(Continued from Page 9)

wire in the 15 amp. fuse does not need emphasing.

For reasonably damp soils an earth resistance of about 1 ohm seems to be the minimum which can be obtained without a large amount of effort and expense.

240 volts are lethal. Most people can stand 50 volts without permanent effects, although I know an electrician who is severely affected by this voltage.

SUMMARY

To summarise:

(1) Every Ham Station should have a separate earth bed with a maximum resistance of about 4 ohms.
(2) Earth beds are most easily made using copper rods or galvanised ¾" water pipes driven at least 4 feet into the soil.
(3) The earth resistance should be measured when the bed is installed.
(4) Earth beds should be checked for corrosion every 12 months and the resistance measured again.
(5) Separate earth beds should be used for antenna towers.

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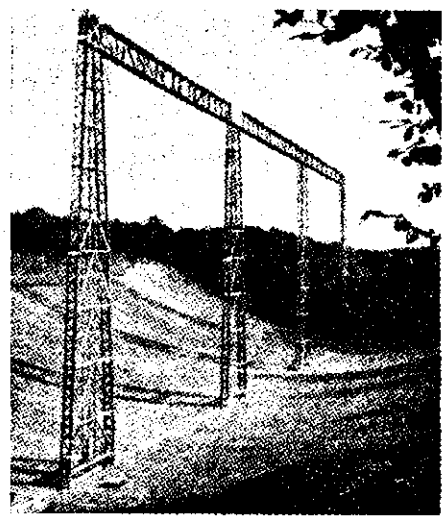
2. Copper for Earthing. Twelfth impression, 1961, Copper Development Association Publication No. 30.
3. Standard Handbook for Electrical Engineers, A. E. Knowlton; McGraw Hill.
4. Symmetrical Components, Wagner and Evans; McGraw Hill.

WOOD FOR GIANT RADIO TELESCOPE

The fact that wood does not cause interference to radio signals is an important property which is being used to an increasing extent in this electronic age.

In the February issue of "Wood Preserving News," an American publication, there is an article concerning the extensive use of wood for construction of towers which support the antenna units of a giant new radio telescope at the University of Illinois.

Important considerations in the design of the antenna supports were the estimated required life of 15 years and the necessity to reduce to a minimum the electrical and radio interference characteristics. This also meant that the structure had to be as narrow as possible.



A guyed timber structure was chosen, consisting of four towers 165 ft. high, joined at the tops by three trusses from which the antennae are supported. The entire structure is only 4 ft. 8 in. wide.

The trusses are of plywood and glue laminated timber construction. All timber in the towers and trusses is preservative treated with pentachlorphenol, ensuring a virtually maintenance-free life.

Because non-metallic and non-conductor fasteners were required below the focal line, densified wood bolts, nuts, and washers were used. Densified wood is made from thin wood veneers impregnated with synthetic resin and densified by heat and pressure.

Only 17 days were required to erect the structure.

(Photograph by courtesy of "Wood Preserving News," Chicago, U.S.A., and extracted from C.S.I.R.O. "Forest Products Newsletter," Dec., 1963.)

CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radio."

WIRELESS INSTITUTE OF AUS.

Federal Constitution Alteration

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the **Federal Constitution of the Wireless Institute of Australia 1947** as follows:—

(a) Delete Clause 21 and substitute—

"21. The Headquarters Division shall call for nominations annually from its members for appointment to the Federal Executive, such nominations to be received not less than 60 days prior to the conclusion of the fiscal year. The nominations which shall include the names of any retiring members of Federal Executive willing to re-nominate shall be submitted by the Headquarters Division to Federal Council for the appointment by preferential vote of seven members, two at least of whom shall be retiring members."

(b) Insert new Clause 21a—

"21a. The new Federal Executive shall take office at the conclusion of the Federal Convention which they shall attend, or where a Federal Convention is not held, within one month of the conclusion of the fiscal year. The Federal Executive shall determine its own offices in such manner as considered necessary."

(c) Delete Clause 24 and substitute—

"24. The appointment of Federal Executive which shall be finalised by the Headquarters Division not less than 14 days prior to the conclusion of the fiscal year shall be notified in writing to Federal Council prior to the conclusion of the fiscal year. The Federal Executive shall notify Federal Council in writing of the offices and appointees thereto within 28 days of the commencement of the new fiscal year or the Federal Convention whichever is the sooner."

Any member of the Institute not in agreement with the proposed alterations should notify his disapproval and the reasons to the Federal Secretary within 14 days of the publication of this proposal.

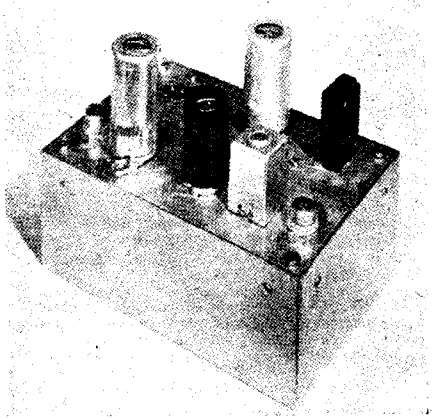
SIMPLIFIED CASCODE CONVERTER FOR TWO METRES*

FROM NOTES BY G3NBQ

THE details on which this article is based appeared in the Coventry Amateur Radio Society's "Newsletter" for April last, in which **G3NBQ** described a two-metre converter intended as a prototype for copying by C.A.R.S. members who might have had no previous experience of v.h.f. construction and circuitry. Several such converters have been built from his design, which is essentially simple and easy to get going—nevertheless, it is capable of giving very good results with the minimum of setting-up difficulty.

Fig. 1 is the block diagram, showing a cascode r.f. stage (E88CC) into a mixer (6AK5) with a twin-triode (12AT7) oscillator-multiplier — just about as basic a layout as you could get for an efficient crystal-controlled job on two metres.

At Fig. 2 is given the circuit in detail. The oscillator-multiplier chain is designed to knock out at 118 Mc., near enough, from a 6.5555 Mc. crystal,



General view of the Two-Metre Converter designed by G3NBQ. It was produced specifically as a prototype to be easily repeatable by any experienced home constructor wishing to make a start on v.h.f. with a good c.c. converter. In this shot, the input end is at upper left and the i.f. socket at lower right. As a simplified, though sound, basic design to the circuit given in Fig. 2, it can be relied upon to give satisfactory results for anyone without previous two-metre experience.

giving the i.f. tuning range of about 26-28 Mc. to cover the (two-metre) band, 144-146 Mc. The crystal frequency is times/3 in the first half of the 12AT7 and then times/6 in the anode of the second half. Provided beats are not thrown into either the i.f. tuning range of the receiver or the 144-146 Mc. signal frequency coverage of the converter, any tunable i.f. can be used by changing the crystal frequency and the order of multiplication in the oscillator chain—but in fact the arithmetic will show that there are relatively few fundamental crystal frequencies that can be used without this sort of interference occurring. The figures given here are to avoid "birdies" in the tuning range.

* Reprinted from "The Short Wave Magazine," September 1963.

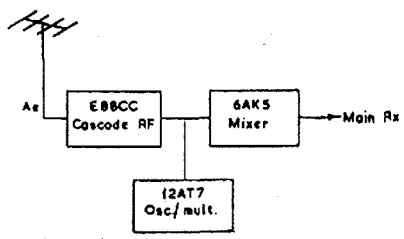


Fig. 1.—Block diagram of the Two-Metre Converter, which is easy to build and get going.

CONSTRUCTIONAL POINTS

The general appearance of the finished job, as built up by **G3NBQ**, is shown by the photographs. To simplify the constructional work, he hit upon the ingenious idea of using 18g. tin-plate, with tin screens, as the mounting, this assembly then being dropped into a standard aluminium box chassis. The advantage of using clean tin-plate, rather than aluminium, is the very important one that soldered joints can be made direct to the chassis. Moreover, since at the constructional stage the "chassis" consists of no more than a piece of flat tin, 5⅞" x 3⅞", to which the screens (two inches deep) can be soldered, the work is much more assessible than when building inside a small box chassis.

One screen is fitted along the centreline of the mounting plate, and the other is placed at right angles to form a 1½" compartment at the input (V1) end—see under-chassis photograph—to screen the two halves of the cascode stage. This under-chassis view also shows how the wiring is simplified, and from it and a study of Fig. 2, starting from the V1 end, most parts can be identified.

After construction, it will be found that the mounting plate with its screens will fit neatly into an aluminium box 6" x 4" x 2½" deep, and can be bolted in by self-tapping screws.

ALIGNMENT

After doing a thorough wiring check, apply power. On connecting the converter into the main receiver, sharsh should be heard; if this is not so, then look over the mixer wiring. When

(Continued on Page 20)

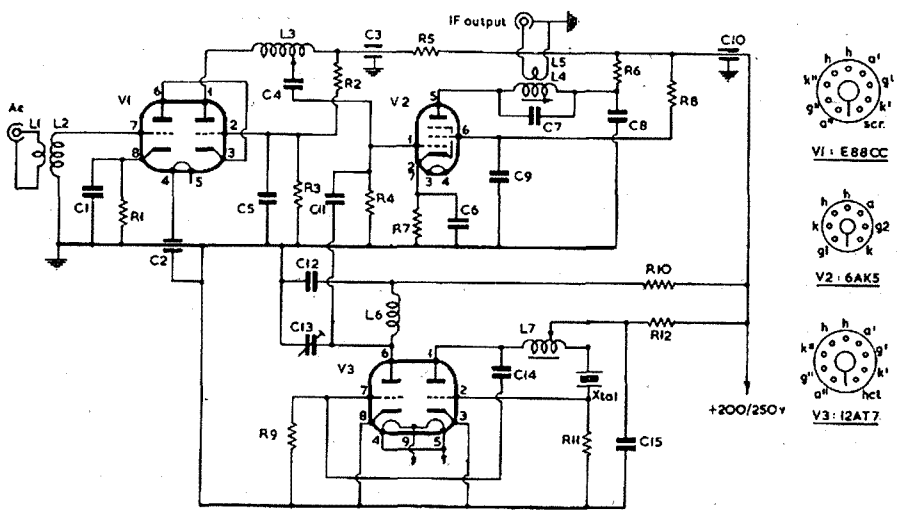


Fig. 2.—Circuit of the Two-Metre Cascode Converter. V1 is in cascode and the twin-triode at V3 multiplies a third-harmonic ("overtone") crystal frequency by six, to give an injection frequency of approximately 118 Mc. for a tunable i.f. range of 28-28 Mc. Other oscillator-i.f. combinations can be worked out to suit individual requirements, provided oscillator beats are not thrown into the receiving chain. The photographs show the simplified form of construction devised by **G3NBQ**, and the article explains the equally simple alignment procedure.

C1, C5, C12—0.001 μF. disc ceramic.
C2, C3, C10—0.001 μF. feed-through.
C4—47 pF. tubular ceramic.
C6, C8, C9, C15—0.01 μF. disc ceramic.
C7—5.6 pF. tubular ceramic (see coil data).
C11—2.2 pF.
C13—2-8 pF. beehive trimmer.
C14—100 pF. mica.
R1—68 ohms.
R2—220,000 ohms.
R3—330,000 ohms.
R4—100,000 ohms.
R5—10,000 ohms.
R6, R9—47,000 ohms.
R7—220 ohms.
R8—1 megohm.
R10, R12—4,700 ohms.
R11—22,000 ohms.
Xtal—6.5555 Mc. x 3.
V1—E88CC (ECC88).
V2—6AK5.
V3—12AT7 (B309).
Note: All resistors rated ½ watt.

COIL DATA

L1—One turn round L2, of 20g. tinned copper, to ½ in. diameter.

L2—Four turns ⅜ in. diameter, 20g. enamel, spaced over ½ in. winding length.

L3—Four and three-quarter turns ⅜ in. diameter, 20g. enamel, spaced over ½ in. winding length, with C4 tapped on one turn from C3 end.

L4—25 turns 24g. enamel, close wound on ¼ in. diameter I.F.T.-type slugged former, fitted in can. Tuned to 27 Mc. by slug and C7. (These details for 26-28 Mc. I.F.).

L5—Five turns of flexible lead over earthy end of L4.

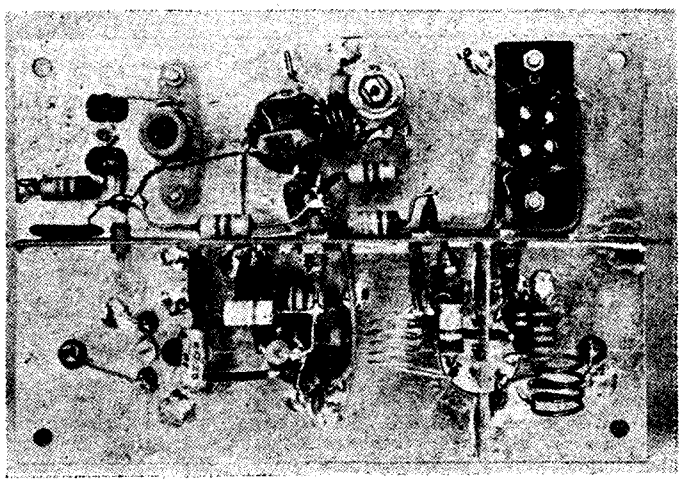
L6—Two and three-quarter turns ⅜ in. diameter, 20g. enamel, spaced over 3/16 in.

L7—For 6.5555 Mc. xtal: 25 turns 24g. enamel on ⅜ in. diameter slugged former, with tap at 3½ turns.

Converter for Two Metres

(Continued from Page 19)

noise is obtained, check the c.o. grid current by disconnecting R11 at the chassis end and putting in a low-range milliammeter; this should show a pronounced peak reading on one setting of the slug in L7. If this does not happen, put a 10 pF. fixed capacity between ground and pin 1 of V3. If the grid current still will not peak, re-wind L7 with a few taps, and determine which tap gives greatest current. You are aiming to get a grid current reading of 0.5-0.7 mA. and when this is obtained, the meter can be taken out and R11 re-connected to the chassis.



Under-chass view of the Converter. The main dimension is 5⅞ in. and the "chassis" is actually a mounting plate, with screens, made of 18g. clean tinplate which simplifies the wiring because earth connections can be soldered. Two screens as shown are fitted (by soldering), the smaller one at right angles being 2 in. deep with a slot cut for the valveholder, and placed to give a 1½ in. space for the V1 input assembly. The finished converter on its mounting plate then drops into a standard 6 x 4 x 2½ in. box chassis, and is secured by self-tappers at the four corners. In this view the aerial input end is at lower right, and the i.f. output coax socket at left.

If C13 is now adjusted, a noise-peak should be heard; no difficulty will be encountered here, as C13 shifts the resonant frequency of the tuned circuit through quite a wide range. Careful adjustment of L3, by spreading out or squeezing in its turns, should peak up the sharsh even more.

On connecting the aerial, something should now be heard from outside, even if it is only ignition noise (which can be very useful for preliminary adjustment of any converter!). There may even be a few signals on the band on which the signal circuits can be peaked by manipulation of L2 and L3, while fiddling with the configuration of L1 with respect to L2 may give you a further gain in signal. For the 26-28 Mc. tuning range on the main receiver, the i.f. winding L4 should be peaked at 27 Mc.

If having reached this happy condition, with something coming in on two metres, the converter appears to go quite dead after switching on again, it will be because the crystal has not picked up. This is a very annoying and not uncommon fault, and can only be prevented by careful adjustment of the c.o. in the first place. It may even be necessary to move the L7 tap a little, to increase the feed-back. In any case, the crystal should be checked out as a healthy oscillator before it is plugged in. The probability is that a strong c.o. beat will be found somewhere on the tuning range of the main receiver (right outside the two-metre band, that is) and this can always be used as a reference point for the activity of the crystal.

It is understood that those converters built to the recipe by G3NBQ, as discussed, here, are giving entirely satisfactory results, and went off first time without difficulty. The design can be confidently recommended to anyone thinking of making a start on the two-metre band. ●

PHONE OPERATION BY L.A.O.C.P. LICENSEES

Pursuant to representation to the Postmaster-General's Department by the Wireless Institute of Australia, the following modes of telephony may now be used by licensees in the Amateur Service holding Limited Amateur Operator's Certificates of Proficiency authorising transmission in the bands above 52 Mc.:—

All authorised bands:
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All bands above 144 Mc.:
A0, P0.
Ultra high and super high frequency bands:
P3d, P3e, P3f.

Licensees will not be independently advised by the Postmaster-General's Department. Amateurs are therefore advised to pass this information by word of mouth and whilst in contact on the air.

FEDERAL EXECUTIVE, W.I.A.

— • • • —

Transistorised V.F.O.

(Continued from Page 7)

than the required stability of 0.003%, as evidenced by my stable zero beat with station NPG on that frequency. It is a constant source of joy when operating in the Amateur bands also. There is absolutely no drift from this source any more!

S.s.b. operators plagued by "drift-itis" and a.m. operators whose frequency shifts with modulation would do well to build and use this little gadget. You c.w. men can actually key it for break-in! It is truly a "Synthetic Rock"! ●

Introduction to Ceramic Dielectrics

(Continued from Page 5)

PIEZOELECTRIC EFFECT

Crystals of quartz, tourmaline or seignette salt, suitably prepared, can show an electrostatic voltage charge on the electrodes if subjected to mechanical stress. This effect, which can also be reversed, is called "piezoelectricity".

It was quite a surprise when, in 1947, it was discovered that mixed crystal ceramics of certain HK types can also be made piezoelectric, after they have been polarised at elevated temperatures. Depending on the mode of operation, these versions of ceramic capacitors can be used as frequency determining element in crystal oscillators, as ultrasonic receiver or transmitter element, as gramophone pick-up element, as high-tension spark element to operate a motor car ignition system, or to measure the pressure time diagram of a gun or motor, to mention only a few applications. Another application, which may soon find wide use, is the transfilter, where discs suitably equipped with electrodes can successfully replace i.f. filters in radio receivers.

OTHER EFFECTS

We have mentioned already that nearly all properties vary if the measuring temperature, or voltage, or frequency, or the shape of the ceramic capacitor changes. Besides the chemical composition, comprising the main ingredients plus some desirable trace elements and many undesirable impurities, the many ceramic production operations, with their controlled and uncontrolled variables, affect the electrical properties of ceramic dielectrics as well.

Putting the electrodes on is not as simple or harmless as it appears either. Silver alone does not bond to the titanates; therefore, the metal paints contain ceramic flux (lead boro-silicate) plus other oxides (Bi_2O_3, TgO) to improve solderability. These ceramic materials react with the dielectric during the firing of the electrodes, more with the upper side than with the lower side of discs. The more flux the silver electrodes contain, the longer and higher the silver is fired; as a result, the K factor will be lower and all other properties affected.

HK bodies containing over 90% Ba TiO_3 absorb far more flux than TiO_2 LK bodies. A disc, K : 10,000 0.010" thick, may lose 30% of the capacity if the wrong silver paint is used. In the case of the oxide skin type capacitors, even the organic solvents and binders affect the capacity. They do not seem to burn out completely.

Several additional effects come in, while the capacitors are being soldered and the solder fills the space between the silver grains. To all these properties and effects, we have to add some 80 variables, which are associated with the usual ceramic processes, according to a list published by the British Ceramic Research Association.

[Part Two, to appear in a later issue, discusses the other half of the job—"How to make Ceramic Dielectrics".]

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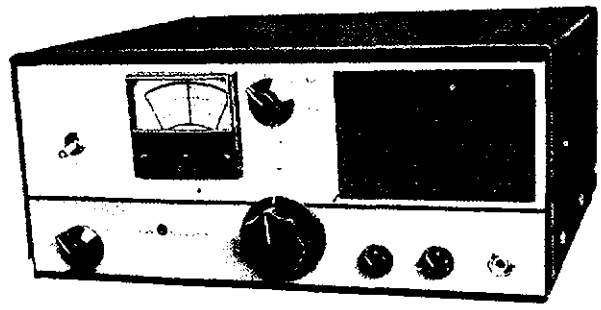

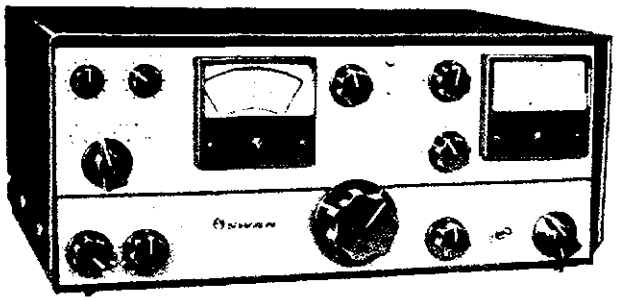

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AMATEUR RADIO

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Vol. 32, No. 3

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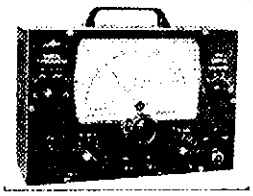

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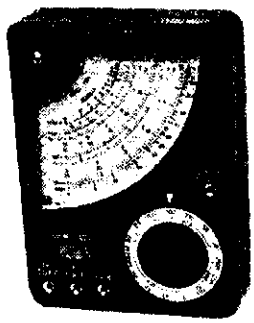

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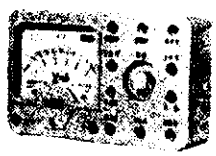

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Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

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★

OUR COVER

During the recent Ross Hull Contest it was possible, due to the activity in VK8, to obtain W.A.S. on 50 Mc., so it is appropriate to show a collection of all VK Call Area cards. The reader should also refer to the Correspondence column (see page 17) and page 14 for the W.I.A. (V.H.F.) W.A.S. Rules.

FEDERAL COMMENT

★

As yet another Easter approaches, so does the annual meeting of the Federal Council of the Institute—the Federal Convention. This will be the 28th meeting of Federal Council at a Convention and could prove to be a momentous one in the long history of the W.I.A. One might ask why this one should be any more important than any other Convention at which matters of policy and the future operation of the Institute are discussed. The answer will undoubtedly lie in the presentation of the first draft of the new Federal Constitution.

This important aspect of the Institute administration was thoroughly discussed at the last Convention where guiding principles for its preparation were laid down. The Institute in the past on a Federal plane has been bound together as a whole only by mutual agreement between the Divisions which are autonomous bodies and as such are not obligated to a Federal amalgamation by law. The principles referred will now enable the Divisions to be bound to a Federal company by law yet still retain their own autonomy within their State boundaries.

The average member is perhaps unaware of the necessity for the existence of a Federal governing body—space would prohibit giving every reason why this should be so; however, the main one would be a central authority through which the voice of the Institute would be heard and which would guide and execute the policies expressed by the different Divisions. There are other functions it would undertake such as the publication of the magazine, the task of which has been that of the Victorian Division for thirty odd years, the Call Book and other tasks which have placed a financial burden and onerous duty on one Division. In our Institute which has been steadily growing through the years, the establishment of a central governing body will enable a more rapid growth to take place which is all-important if Amateur Radio is to survive in Australia.

There will, of course, be many other important items to discuss at the Convention in Adelaide, which is the venue for the first time since 1935. The success of this or any other Convention depends largely on the interest of the members of the host Division, and although Easter is a time when holidaying is prevalent, any members who can be present at the deliberations of the Federal Council are always welcome and can learn something useful about Federal administration of our Institute. We can promise an interesting experience for any visitors who can come along, and in addition we hope, a most profitable and momentous Convention from the aspect of decisions and policies.

FEDERAL EXECUTIVE, W.I.A.

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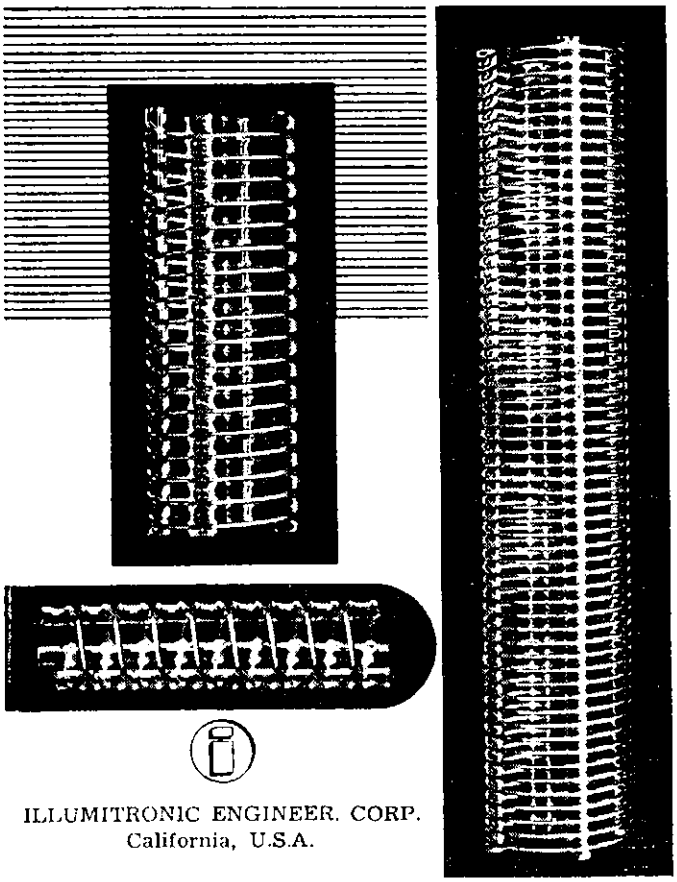

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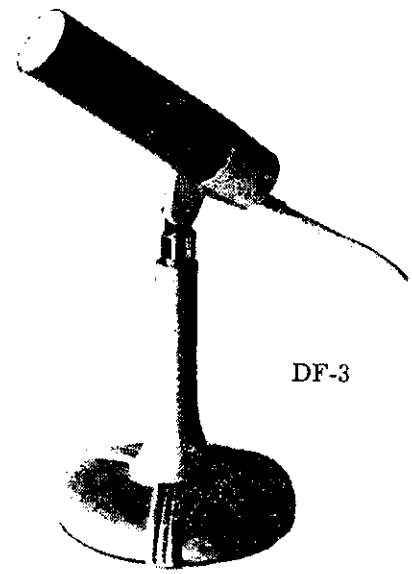

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A LOW-COST U.H.F. GRID DIP OSCILLATOR

C. HAGOORT, VK5ZKC, and B. CLEWORTH,† VK5BQ*

With the 70 Cm. band now available, some v.h.f. enthusiasts will want to construct equipment for this band. With this idea in mind, the writers have been experimenting with various circuits, tubes and layouts, and finally have decided on the following design.

No originality is claimed for the particular circuit used, however, it will be observed that the layout is novel and quite effective in practice.

Although it would be preferable to use tubes such as the 6CW4, which would result in a higher maximum frequency, we used the 6J6 because it is readily available and has a satisfactory maximum frequency capability (in this g.d.o., 550 Mc.).

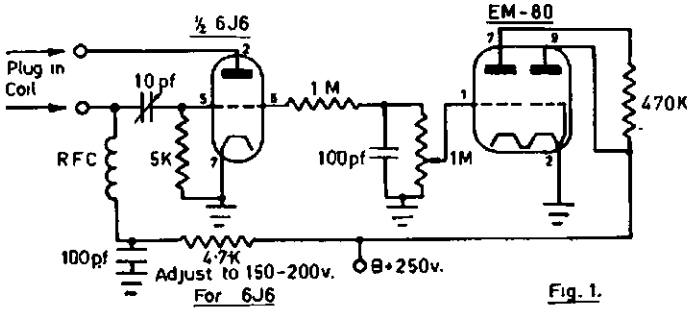


Fig. 1.

C1—100 pF.
C2—10 pF.
C3—100 pF.
R1—10K ohms.
R2—470K ohms.
R3—4700 ohms.
R4—1 megohm linear pot.
R5—470K ohms.

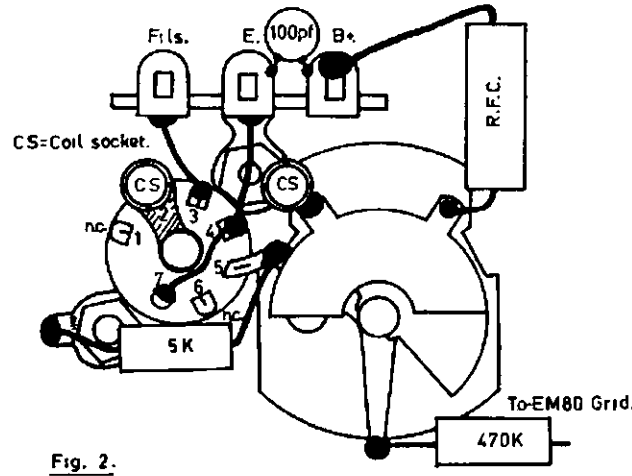


Fig. 2.

Everyone knows that the 6J6 will oscillate up to 600 Mc. with suitable tuned circuits, but it is not so easy to make it oscillate over the wide frequency ranges necessary for a practical g.d.o. This is further aggravated by the fact that the maximum capacity of the tuning capacitor will have to be reasonably large in order to provide as large as possible a frequency range with each coil. With these problems in mind, the series tuned circuit (Fig. 1) was tried and found to give the desired result. The only serious disadvantage is that the grid current varies over fairly wide limits, from maximum to minimum settings of the tuning capacitor.

To minimise this, a "magic eye" tuning indicator was used in both grid dippers since it has the advantage that it will cater for wider variations in grid current than a meter, the pointer of which can only be of assistance whilst it is "on scale".

In addition, it may be found desirable to use a sensitivity control as in the 5ZKC instrument. This is used to reduce the negative bias on the EM80 when the low end of each coil range is approached. Whether this is necessary will depend to an extent on the type of indicator used. A much older tube with no sensitivity control was used at VK5BQ.

The tuning capacitor used is a small single bearing type of about two plates at 5BQ, and three plates (10 pF.) at 5ZKC. The shaft of this tuning capacitor is "hot" for r.f. and will therefore have to be insulated if hand capacity effects are to be eliminated. The material used is polystyrene.

Next comes the problem of the coil socket. If the overall frequency range of the instrument is to be as large as possible, then plug-in coils are indicated. Insulating materials which are satisfactory at the lower frequencies are often very "lossy" at u.h.f. The problem has been overcome in the following manner.

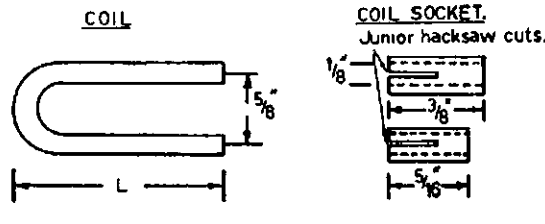
Two short pieces of brass tubing ⅛" inside diameter and about ⅜" long are made into two little sockets by cutting four slots with a junior hacksaw as indicated in Fig. 3. One socket is soldered rigidly to the fixed plate of the tuning capacitor, and the other one directly to the plate pin of the 6J6. The plate pin is then braced to the centre terminal of the 7-pin socket with a "blob" of Araldite.

This method has the advantage that there is no additional dielectric loss over and above that in the valve socket and tuning capacitor insulation. Reference to the layout drawing (Fig. 2) will show how this socket is arranged.

The coils themselves are made from ⅛" outside diameter copper tubing, bent into the shape of a hairpin loop. Finally, after calibration, they are finished with a piece of P.V.C. tubing pushed over them. This precludes the possibility of shock to the operator. A neat job will result if the tubing chosen is a very tight fit and pre-soaked in a solution of amyl acetate or duco thinners to swell it. When pushed over the coils and allowed to dry it will shrink back to its original size. Different coloured tubing for each coil can be used to facilitate identification.

The coils can be calibrated with the aid of Lecher lines. With care an accuracy of approximately 1% can be obtained with this method. As the exact dimensions of the coils will depend to an extent on the tuning capacitor used, the dimensions given in Fig. 3 should be taken purely as a guide. With the exception of the top one, the coils should be made longer than necessary and small pieces trimmed off until the required overlap in frequency is obtained. 10 to 15 Mc. will be ample. The total frequency range of the VK-5ZKC unit is from 285 to 555 Mc.

A scale can then be pasted to the outside of the case and calibrated from 0-100. Transfer this to the X axis of a graph, the Y axis of which is marked off in megacycles. Curves are then plotted for each coil in the usual manner. ●



Length of coils.(approx)
A-2 7/8". B-2 3/4". C-1 13/16".
C-1½". D-1".

Fig.3.

* Larkdale Ave., Sydenham, South Aus.
† 14 Coronation Av., Campbelltown, South Aus.

CONSIDERATIONS IN RECEIVER FRONT-END DESIGN*

AL BROGDON, K3KMO/DJ0HZ

The author explains the importance of r.f. selectivity and linearity, and methods of improving this important characteristic

THE Radio Amateur is faced with a communications problem which is unique in many ways. One of these unique features is that the Amateur is allocated continuous non-channelised frequency bands through which he may romp at will. This is found in no other communication service. This freedom to choose an operating frequency, plus the fact that there are more Amateurs in the United States than can be comfortably accommodated by the frequencies available for their use, results in mass mutual interference. This over-population of the Ham bands will certainly never lessen; on the contrary, it appears as if it must become progressively worse. The major factors contributing to this increasing problem are the phenomenal rate of growth of the U.S. Ham population, and the increasing pressure to reduce the Amateur's frequency allocations.

Thus, we may look forward to more and more interferences on the high frequency Ham bands. Practically the only approach to the solution of this interference problem is that of narrowing the bandpass of the communication receiver until it is just wide enough to accommodate the desired signal.

In the typical communication receiver the high selectivity is built into the lowest frequency i.f. stages. The selectivity curves as shown in equipment specifications are principally the selectivity of these low i.f. stages. These curves lead us to believe that this is the performance capability of the receiver, but the sad fact is that this selectivity cannot be linearly transferred back to the antenna terminals of the receiver.[1] The reason for this is that the tuned circits of the receiver are linked by vacuum tubes (or transistors)—nonlinear elements. So the actual bandpass characteristics of the receiver will be degraded by the amount of nonlinearity in the transfer. Let's take an example to show the difference between the i.f. bandpass and the overall bandpass characteristics of a receiver.

On field day, there will often be two operating positions in close physical proximity but on widely-separated frequency bands. According to the manufacturer's (i.f.) selectivity curves, there should be almost an infinite amount of attenuation at such far-band frequencies. Yet the interference is present. Let us consider the reasons for the existence of this theoretically impossible interference.

The level of the undesired signal becomes so great that it causes the r.f. stage to draw grid current, causing any of a number of types of interference to occur. The sensitivity of the receiver may be seriously degraded due to the extra bias placed on the over-driven stages through the excessive grid current. Cross-modulation may result because of the overdriven stage's nonlinearity. Harmonics of the undesired signal are generated, which may cause a spurious response. Two strong signals may combine in an overdriven r.f. stage to produce intermodulation products. When one of these products falls at the receiver tuned frequency, it will cause interference.

With all of these possible sources of interference, it becomes obvious that the linearity and selectivity of the r.f. amplifier stages become very important in the reduction of interference from undesired signals. Although most Hams think of selectivity in terms of the i.f. selectivity, higher r.f. selectivity will pay off with better receiver performance in the presence of interference.

A.V.C. AND BIASING

The use of proper biasing techniques in the r.f. amplifier stages is an absolute necessity. No r.f. stage should be operated without self-bias, and a.v.c. bias should be applied to all r.f. stages (plus the i.f. stages if desired). Two sophisticated systems that are recommended are the "delayed" a.v.c. and "hang" a.v.c. systems.

A delayed a.v.c. system is one in which the receiver is operated with the r.f. stages at maximum gain until a received signal reaches a predetermined level, after which the a.v.c. voltage is proportional to the signal strength. The hang a.v.c. circuit was developed for use with c.w. and s.s.b. reception, and features a fast attack time and a slow release time. This results in a.v.c. action which is applied at the first syllable (or c.w. character) with an unnoticeable delay, and holds in between words (or characters) to maintain a constant output during a transmission.

R.F. RESPONSE

A spurious response can occur in a receiver when an undesired r.f. signal reaches the signal grid of the mixer. The selectivity of the r.f. amplifier determines the degree of rejection of the undesired signals. Therefore, the selectivity of the r.f. amplifier stages of a receiver must be considered over a wide frequency range. By injecting a signal at the antenna terminals of a 3 to 30 Mc. communication receiver, and measuring the voltage developed at the signal grid of the mixer stage it was possible to produce an r.f. selectivity curve. Thus it included the selectivity of all tuned circuits between these two points.

It was seen that the off-frequency attenuation rose to a maximum just above the tuned frequency, then gradually decreased and decayed into erratic valleys and peaks. The receiver under test was tuned to 14 Mc. The attenuation in the vicinity of the two metre band was only 30 db. Thus it would be possible for a Ham using the tested receiver on twenty metres to experience interference from a nearby Ham operating in the two metre band! Sometimes interference crops up in unexpected places.

It is possible to minimise the erratic behaviour of the off-frequency selectivity of the r.f. stages, although it cannot be entirely eliminated. The performance may be improved by using minimum lead lengths, shielding between stages, filtering of all leads except signal leads, and the usual good design practices. In addition, the overall far-frequency attenuation may be improved through the use of external selectivity aids.

Most Hams nowadays use a common antenna system for both receiver and transmitter, with either a T-R switch or antenna change-over relay to connect the antenna feed-line to the transmitter and receiver. Also, most of these Hams use low-pass filters to minimise t.v.i If the antenna change-over system is such that the filter is between the receiver and the antenna, when the switch or relay is in the receive position, it will provide an additional 30-80 db. of attenuation above its cut-off frequency. Also, some T-R switches themselves are frequency selective, giving the user an additional off-frequency attenuation of perhaps 10-30 db. Various bandpass filters have appeared in the Ham magazines specifically for use in multi-transmitter contest operation, and will provide additional attenuation of undesired signals. All of these may be used to increase the r.f. selectivity of a communication receiver.

R.F. PREAMPLIFIERS

It would seem at first glance that the r.f. selectivity of a receiver could be greatly improved through the use of the commercially available preselectors. Actually, this title is not entirely accurate, since the units are primarily designed to act as preamplifiers, and may or may not have good selectivity characteristics. An example of this is the line of R.M.E. preselectors. The old DZ-22A was not only a good high-gain preamplifier, but provided outstanding preselection through its three gang-tuned circuits. However, the current R.M.E. preselector, the DB-23, has only one tuned circuit for each frequency band. The preamplification is excellent, but the preselection is very poor. At some points, the rejection of far-frequency interference may only be 18-20 db., which may lead to interference being generated within the DB-23 itself. Thus, the DB-23 would be a very useful addition to a receiver if

(Continued on Page 13)

* Reprinted from "CQ", July 1963.

[1] Brogdon, A., "Two-Signal Selectivity Measurements," "CQ", August 1962, page 60.

INTRODUCTION TO CERAMIC DIELECTRICS*

PART TWO

H. F. RUCKERT,† VK2AOU

CERAMIC DIELECTRICS
An Engineering Problem

The case of Centralab, U.S.A., gives some idea of what is involved.

Centralab, a leading U.S. ceramic capacitor manufacturer, stated in 1948 that 30 ceramic and electronic scientists and engineers worked 150,000 hours preparing 25,000 HK compositions, but only two of these were used for mass production. Further, they stated that it will take them 15 more years to evaluate all measuring results and investigate special observations more closely.

This statement underlines the complexity of the job and the nearly infinite number of possible combinations. As one may well imagine, we could not do the development of ceramic dielectrics on such a grand scale in this country, but this example shows how much work is involved if one wants to reduce the chance of overlooking possibilities.

Our Job: In our profession, it usually goes like this:

A customer sends us a t.v. circuit and wants a suitable capacitor for a certain application, or he sends us some foreign capacitors and wants us to make exactly the same type. If we find something interesting in a technical magazine or in the patent literature, then a new developmental programme may be initiated, and the same is the case if we have a new idea ourselves.

In all the cases we have to translate electronic properties into chemical formulations, and these into ceramic processes (without a dictionary). Next, we have to prepare and measure ceramic capacitors, evaluate the results, and correct the formulation and change the ceramic processes to achieve the required properties more closely. This often means that electronic measuring techniques and new ceramic processes have to be developed. Production and measuring techniques have to be well understood, or the results will be misleading.

SOME CERAMIC DIELECTRIC FORMULATIONS

LOW LOSS STEATITE

Typical insulator porcelain, at 1 Mc., has a P.F. 30 to 100 times higher than good mica or ceramic. The TC_c is many 100 parts per million positive, and the I.R. falls rapidly at elevated temperatures. The alkalis were found to be mainly responsible for this, and it was also found that the same is so when glass compositions were tested. This means that we cannot use feldspar or clay with a high flux content, mainly sodium is dangerous.

The low loss steatite, composed of very pure talc (HgO-Al_2O_3-SiO_2) plus carbonates of earth alkalis (Mg, Ca, Ba) and other oxides as mineralisers, was the answer. Only small amounts of clay, contributing traces of flux, have to be added often to achieve vitrification below 1,400°C. The low P.F. of 0.04%, high I.R. of up to 10^{12} Ω/cm. at 200°C., and the low K of 6 to 7 make this material very suitable as r.f. insulator, where low, stray capacities are required.

The TC_c of PI40 to 180 was more important in the past, because iron dust cores in coils of tuned circuits had a negative TC of the permeability and the resulting frequency drift could be compensated with steatite capacitors (German trade names, since 1932, are: Calit, Frequenta). L.L. steatite is widely used in switches, valve holders, terminals, v.h.f. coil forms, transmitter aerial insulators, etc.

LK DIELECTRICS

The electronic industry required dielectrics with higher K factors to be able to make less bulky capacitors. Suitable mica was not available in Germany around 1930-34, but they remembered a patent of Schmidt, 1902, in which he had found that TiO_2 had a K factor of 117. Then the Hescho and Stemag Companies developed, during the period from 1934 to 1938, a range of LK dielectrics with:—

K Factors of	14	40	80
TC_c	NPO	N400	N750
P.F.	0.02%	0.2%	0.1%

and 1938/1939:—

K Factor	40	
TC_c	N120	N250
P.F.	0.02%	

Nearly all the shapes and styles still used all over the world today were developed by these two firms about 25 years ago. The compositions used in those days were relatively simple:—

TC_c	Mainly containing	Trade Name
NPO	MgO and TiO_2	Tempa S.
N120	La_2O_3 and TiO_2	Tempa T.
N400	Clay and TiO_2	Condensa N.
N750	10% Clay & TiO_2	Condensa C.

These dielectrics had peculiar properties.

The NPO needed 1,450°C. to fire dense.

The N120 shrank about 50% (extruded tubes).

The P.F. increased 100 times at 800 c/s., 100°C., and the TC_c became P7000 under the same conditions.

The N750 had a P.F. which was too high at A.F. before ZrO_2 was added.

The best bodies do no longer contain any clay.

Many compositions have changed since and they often contain up to 6 or 8 oxides, most of which have been pre-reacted in groups during a calcining process. One group allows for the adjustment of the TC_c mainly, and another group influences the K factor. Again, other additives improve the P.F. so that there is no deterioration under accelerated life test conditions (100°C., 100V/thou.), which could cause in some cases a partial reduction of TiO_2, affecting P.F., I.R. and breakdown level.

The importance of temperature compensation was gradually appreciated more and more by radio designers, and this requirement had to be satisfied for all Armed Forces' equipment, and now too for domestic receivers. The introduction of ferrite coil cores for inductances of tuned circuits called for higher N TC_c capacitors for the achievement of good compensation of frequency drift.

These are the reasons why we have all over the world now 17 standard TC_c values of:—

P150	P100	P33	NPO
N33	N75	N150	N220
N330	N470	N560	N750
N1500	N2200	N3300	N4700
N5600.			

It seems to be possible only to produce high P TC_c values either with a low K factor or with a high P.F. The more common oxides of Zn, Sn, Zr, Mg, Ba, etc., are often used, which give suitable P.F. and K factors if just sufficient TiO_2 is added to achieve the desired TC_c. The N750 body is still to 75-90% of TiO_2, but much research work had to be carried out to overcome the P.F. increase occurring formerly after flash tests. The more negative TC_c values can be obtained with alkaline earth titanates such as Ca and Sr, but other oxides have to be added to obtain the properties which are now world standard.

The highest K associated with low P.F. and the standard TC_c is the target, but practical production requirements have to be considered as well. An LK series which would require a different firing temperature for each TC_c type would be quite a costly nuisance for tunnel kiln operation; also, the TC_c and P.F. should not depend too much on the firing temperature (±25°C.).

It is now possible to make NPO or N750 bodies with losses so small that discs ⅛" thick, with an oil-protected surface, have a P.F. so low that many well known Q meters do not register a P.F. at all. It is, therefore, not surprising that transmitter plate type capacitors using these dielectrics have almost entirely replaced the much larger and more expensive mica capacitors.

HK DIELECTRICS

It was around 1941/42 that the high K factor of Ba TiO_3 was discovered in U.S.A., Germany, Japan and Russia. However, most of the early work on HK bodies was carried out by Dr. E. Wainer, of the Titanium Alloy Manufacturing Co., and the many patents are proof of the tremendous work done and the important results achieved.

---

* From a Lecture given to the Ceramic Society of Australia (N.S.W. Division).

† 25 Berrille Road, Beverly Hills, N.S.W.

The K factor vs. temperature curves or TC_c graphs are most important in comparing HK dielectrics.

The graph, Fig. 1 (curve 1), shows the TC of the K factor of 99.8% pure Ba TiO_3, and the curve II. gives an indication of the importance of having the correct stoichiometric ratio (+6% Ba O). The reduced K factor of curve III. shows one reason why clay is usually no longer found in capacitor dielectric formulations. Too much milling jar and pebble material have been ground off and contaminated the Ba TiO_3.

In Fig. 2 we see the temperature v. K curve of Sr TiO_3 and Ca TiO_3. The obvious aim was to shift the Curie Point of Ba TiO_3 from +120°C. and the K peak of Sr TiO_3 from —100°C.

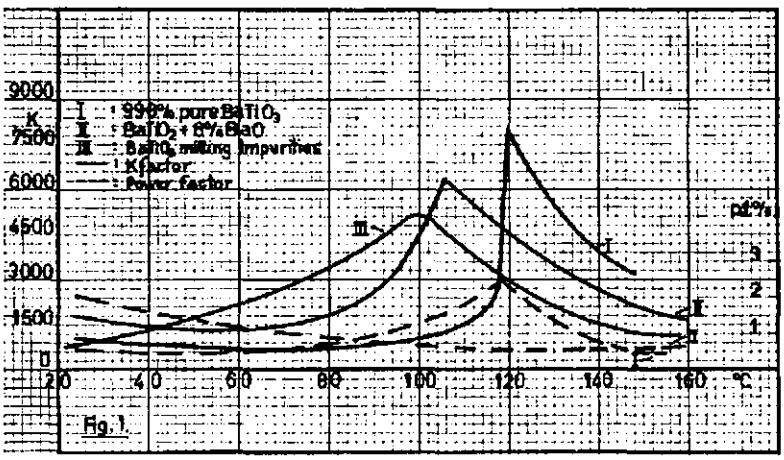


Fig. 1

or so to the usual operating temperature of about 30 to 40°C. for radio and t.v. receivers, in order to raise the usable capacity.

By combining Ba TiO_3 and Sr TiO_3 in a ratio of 80 : 20 parts, we can achieve this first aim.

The next target was to broaden the peak, to reduce the TC_c or to increase the K factor below and above the K maximum.

In spite of the tens of thousands of combinations made, the hundreds of patents claimed, and the trying of all metal oxides listed on the periodic table —including rare elements—it was not possible to achieve a K : 5.000 or 10,000 NPO body.

Figs. 3 and 4 demonstrate how additions to Ba TiO_3 can modify the K vs. temperature curve.

Many titanates, stannates and zirconates are being produced in commercial quantities by T.A.M., to be available as additives to Ba TiO_3.

It may be of interest to know that Ba can be replaced by Niobium, but the higher cost makes this material unattractive. When developing an HK dielectric, we can first try to obtain a certain maximum K, then an acceptable TC_c, next a good break-down voltage of 8 kv. d.c. per 0.030" material thickness, a P.F. of 2% or less, and an I.R. of 10^5 MΩ per ¾" diam. disc. The raw materials needed, to achieve these developmental steps one by one, must be readily available and of a sufficiently consistent quality (BaO/TiO_2 ratio, type of impurities, percentage of impurities), and the price must be small compared with the labour cost of the product.

After satisfying the electronic requirements laid down by the customer or the world-wide standard of development, our ceramic production men call for modifications, so that the new mixture is easy to press or extrude, that the kiln furniture does not become contaminated, that the existing furnace does not cause heat-shock cracks, that warping does not occur, that firing in layers without a separating medium is possible, and that an already used production firing temperature below 1380°C. will give all the listed properties achieved in the laboratory. Quite often, we have to start all over again and again, trying to fit one more requirement in a scheme developed so far, without losing other valuable features.

We, therefore, have a sample collection with capacitors from all tests in several thousands of numbered envelopes. All measuring data are being recorded in a library of lab. record books accumulated over 10 years. Quality control tests, with statistical evaluation of results and 2,000 h. accelerated life tests with climatic cycles, are carried out next, before a dielectric is approved for mass production of capacitors. If, finally, the customer does not like it, then the project has to go back to the ceramic lab. once more.

PIEZOELECTRIC BODIES

Most bodies containing Ba TiO_3 become piezoelectric after polarisation. This is usually done by heating the capacitor up in oil above the Curie Point (130°C.), applying 100v./thou. and cooling the parts down gradually with the voltage applied. In recent years, PbO-ZrO_2-TiO_2 bodies have gained importance, because their resonance frequency and piezoelectric coupling factor is far more stable with time and temperature. They often contain other oxides as well.

The firing of bodies, which contain PbO to over 50% dense, presents many problems. Lead vapour atmosphere of the right pressure, saggers and kiln furniture, which do not become fused by lead vapour, have to be used, to prevent too much shrinkage, porosity, distorted shapes and an unbalanced composition. Used in transfilters as radial mode overtone resonators, uniform structure and diameter are very

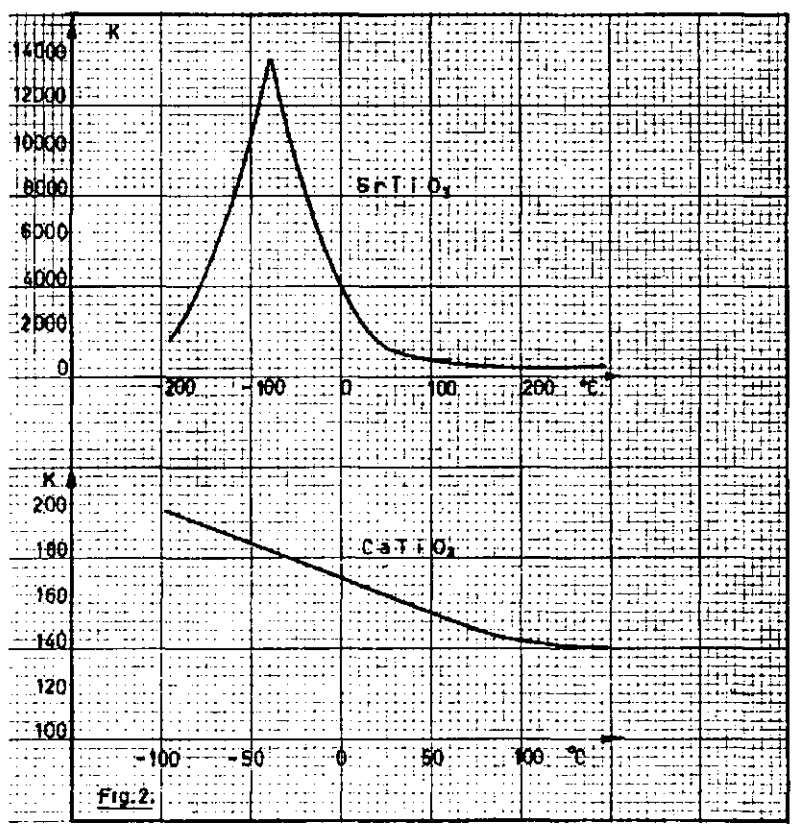


Fig. 2.

important to obtain low insertion loss, selectivity and few spurious resonances. These dielectrics are now becoming very important as more applications are found.

SEMICONDUCTOR CERAMICS

Semiconductor ceramics have been used in Germany since 1946 as heating elements in hot plates and cigarette lighters containing TiO_2, iron oxide, tin oxide and other ingredients. Uranium dioxide has long been used in thermistors by Siemens in a.c.-d.c. radios. Some ferrites and modern thermistor bodies also come into this class. Semiconducting bodies have also been developed using transistor-like techniques. The following three types may be mentioned:—

(i) To increase the capacity per unit of component volume, as required by modern miniaturisation (transistor sets, space rockets), thin sheet HK pieces can be stacked by interposing alternatively conducting ceramic thin sheet pieces to act as electrodes (compare stacked mica and tin foil capacitors). The latter ones are composed of titanates and iron oxide. The stack is fired to form one block, which is not as fragile as individual silvered thin sheet pieces, 0.002" to 0.010" thick, made by various manufacturers.

(ii) The oxide skin type of dielectric is formed by adding a small percentage of rare earth titanate to an HK body. When this body is fired in oxidising atmosphere, a typical HK ceramic results, with an I.R. of 10^6 MΩ and a certain Curie Point and HK P.F., but, in reducing atmosphere, a material which is nearly black of very low I.R. is obtained. If now these pieces are reoxidised on the skin, by firing under suitable conditions, we can achieve an extremely thin oxide dielectric skin on a robust disc. In this way, effective apparent K factors of several millions are obtainable. In fact, we have two HK capacitors in series with a common ceramic semiconductor inner electrode. Highly sensitive piezoelectric transducers can be made in this way.

A ceramic diode results if one skin is damaged or broken down, because now the conductor electrode contacts the ceramic semiconductor. The TC_C can be made quite low by adjusting the composition. Due to the thin dielectric, 0.0005" for 30v. types and far less for 3v. units, even this low voltage represents a very high field strength, and the capacity drops considerably with increased voltage. Even so, the I.R. reaches 1,000 to 10,000 MΩ and the breakdown voltage is usually 150 to 800v. for 30v. types. We were among the first few countries and firms in the world to market this type of capacitor. In the lab., we achieved, with a special process, up to 30 μF. on a ½" diam. disc. suitable for 3v., but this type is not yet on the market. That is 4,000,000 times the capacity a porcelain disc of the same size would have.

(iii) The barrier layer capacitor does not use a true ceramic dielectric any more. The ceramic is usually Ba TiO_3 with a critical Ba O to TiO_2 ratio doped with a small and critical amount of a rare earth or other oxide, which will affect the Ba TiO_3 crystal structure in such a way that the body becomes a semiconductor already when fired in air.

With commercial grade titanates, which have 2 to 3% impurities, and which may be out of balance by up to 4% as far as the stoichiometric ratio is concerned, firing under reducing conditions is still necessary to obtain the best properties, but reoxidisation is not attempted in this case.

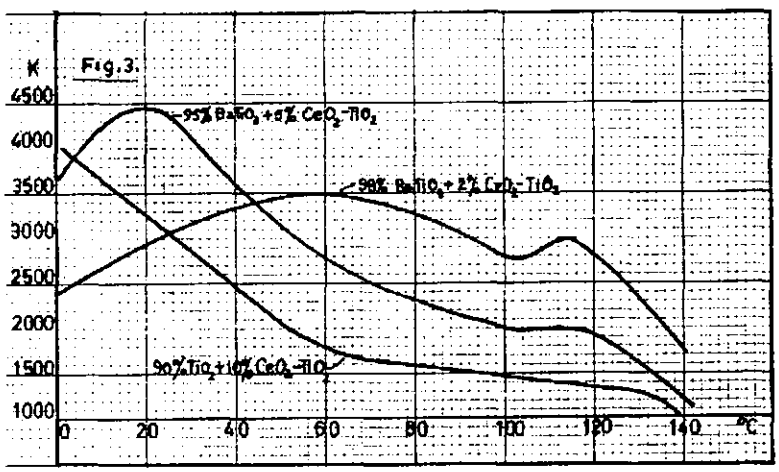
At the interface of the semiconductor (here a ceramic) and the conductor (here the silver electrodes), diodes or rectifiers are formed. If we use indium or nickel as one electrode, to obtain an ohmic contact on this side of the ceramic and no diode, and silver on the other side, we will see that a d.c. current will pass 1,000 or more times better through this junction in one direction than in the other direction. An N type diode effect is being observed. (This is a simplified picture).

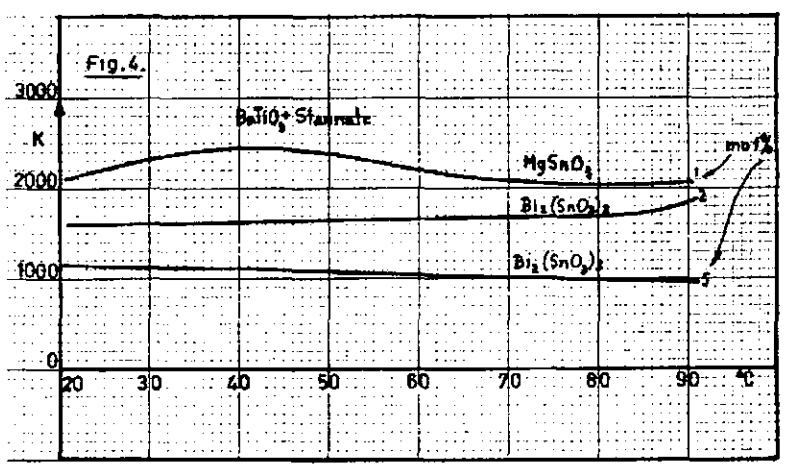
Usually, we have silver electrodes on both sides of the semiconducting ceramic, forming two similar diodes with opposing polarity, so d.c. current is greatly hindered in both directions by the reverse resistance of one diode for each polarity, and it looks, therefore, like a typical capacitor. The actual dielectric is formed by the reverse field causing an electron depleted area called double layer occurring at the interfaces of the semiconductor and suitable conductor due to their inherently different number of free electrons.

That is why the TC_C, piezoelectricity and other dielectric properties of the ceramic, otherwise expected due to the HK type composition, cannot be found any more on these diode components which can be used as capacitors. The maximum working voltage, in combination with an acceptable I.R. or leakage current and P.F., is usually 12v. 1 μF. capacity on a ½" diam. disc for 3v. and an I.R. of 20 KΩ or 0.5μF. with 300 KΩ I.R. are possible.

One U.S. firm has produced this type of capacitor for over a year, and five more firms have marketed these capacitors in recent months. We have developed similar units also. The TC_C and voltage co-efficient of the capacity are low, but the leakage current is more in the order of the values measured on electrolytic capacitors. (We may even call the electrolytic capacitor a wet ceramic capacitor having an aluminium oxide body, and other combinations are possible, also.)

Some 200 millions of ceramic capacitors have been made in this country in recent years, doing their job in radios, t.v. sets, ships, aeroplanes, transmitters, fluorescent lights, and many other applications. ●





ACKNOWLEDGMENT

The permission of the management of Ducon Condenser Pty. Ltd. to present this paper is gratefully acknowledged.

THE EDITOR REGRETS . . .

that certain actions taken by the Publications Committee have not been fully understood by some Amateurs, so this article is published to further explain the Editorial in the 1963 October issue of "A.R."

"Amateur Radio" magazine has a fixed income so that as further demands are made upon the Publications Committee to add additional features, it is necessary to adopt either one of two courses of action. If the magazine is made larger, costs will be increased and there is not enough money available to pay for the larger size issue. Therefore if additional items are to be added, space can only be made available by reducing that already taken up by existing features.

Over the past years articles devoted to S.W.L., Y.R.C. and S.B. have been added to the magazine, as your Committee believes that many readers are interested in these, and other subjects. But by publishing all such matters it has reduced the overall technical content of "A.R.," and it is considered that most readers would prefer to have technical articles.

Accordingly it was decided to reduce the amount of space allocated to non-technical matters. It has never been said, nor has it ever been the intention of the Publications Committee not to publish any notes from the various sources.

Due to the Christmas holiday period, together with the close down for annual holidays, it was not possible to publish any notes or Hamads in the February issue of "A.R."

The above brief outline explains the broad principle behind the facts previously stated in the October "A.R." Editorial. The following paragraphs give a more detailed statement regarding specific matters about which some Amateurs are making incorrect statements. These are the facts.

DIVISIONAL NOTES

Divisional Notes from all sources will still be published in "A.R." and all correspondents are asked to forward their notes each month. However, the amount of space that will be made available will be reduced, so correspondents should not be offended if some of their notes are omitted.

Never has it been the Committee's intention not to publish Divisional Notes. The October Editorial suggested that correspondents should publish purely local matters in their Divisional Bulletins, and forward items of general interest to "A.R." for inclusion in their Divisional Notes. Regrettably, some correspondents have not forwarded any notes and whilst it is not correct to name any one in particular, the Committee consider that many Amateurs miss the omission of the VK5 notes.

The facts are that "A.R." will publish Divisional Notes but less space will be made available. It is suggested that correspondents forward about one-third less notes, so reducing their space requirements. This will save time in editing.

Similar comments apply to the notes from the V.H.F., S.W.L., Y.R.C. and DX sources, etc.

Remember that "A.R." will still publish the various notes, but we cannot give each correspondent as much space as he would like. This can only be done when more money is made available to publish the magazine. Each page costs about £13 and at present we cannot afford to add more pages each issue.

SIDEBAND COLUMN

The Sideband column has been temporarily discontinued until such time as a suitable sub-editor is obtained. When the facts became available to your Committee they were faced with the problem of producing three issues of "A.R." in the one month. Rather than add to their problems, they decided that the matter of publishing the Sideband column would be held over until early in 1964 when they could more fully consider it. Due to misunderstandings, statements are being made that "A.R." will not publish a Sideband column.

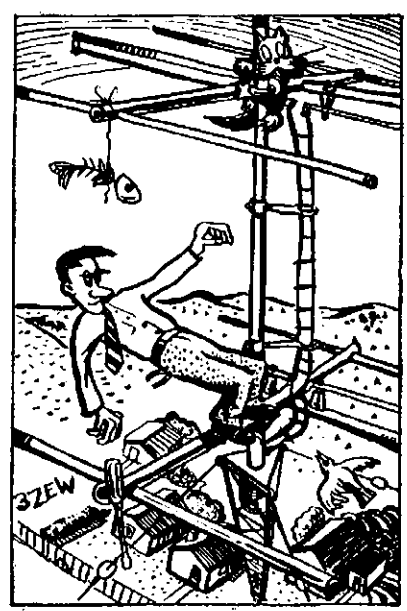
This is not a fact. Technical matters dealing with Sideband will again appear in "A.R." as soon as we can obtain the services of a suitable volunteer sub-editor.

PREDICTION CHARTS

When the Ionospheric Prediction Service advised the Publications Committee that they could no longer provide the Prediction Charts in the form they had previously appeared, we had no option but to discontinue this service. No one on the Publications Committee is qualified to prepare suitable charts from the current information supplied by I.P.S. To publish this information in graphical form, as is currently provided by the N.S.W. Divisional Bulletin, would cost "A.R." a very large sum of money. As already stated, we have not the funds available to do this job.

Until such time as we can afford to publish the charts in graphical form, or until some reader will volunteer to prepare such charts in another form, your Committee has no option but to temporarily discontinue this feature.

Suggestions from any reader on the matter would be welcomed and you may be assured that we will give every assistance to again provide this feature in "A.R."



"The Amateur is Balanced"

PUBLICATION DELAYS

"A.R." is run by an honorary voluntary committee who meet on the second Monday of each month. At this meeting all matters addressed to the Publication are considered and acknowledgment sent to the writers.

Technical articles have to be read and where necessary alterations made to the text and drawings have to be prepared in the majority of cases. Thus it is very rarely that a technical article can be published in the next issue of the Magazine. Generally three months at least will elapse from receipt of the article to its publication.

Some Amateurs overlook these details and become intolerant of the delays in seeing their article in print. They should realise that much work has to be done before their article is printed, particularly when detailed drawings are needed.

Your Committee does welcome readers' comments, not necessarily for publication, and if you are prepared to write you can assist to guide us in issuing a magazine you want. Remember, however, that we are limited by finances. We can only do what we believe to be correct. You must guide our thinking.

As Amateurs we possess two vital forms of communication, a magazine and our hobby, Amateur Radio. Yet problems still exist as the message does not always get across. Instead of passing unfavourable comments to your fellow Amateurs, why not advise the Publications Committee direct? In any organisation critics will aways be found, yet it is always difficult to obtain volunteers to do any job.

Amateur Radio is our hobby, yet to cater for you, by preparing a magazine, requires some persons to devote much of their free time. Perhaps you may be prepared to also assist by some contribution to "A.R." Your committee can only prepare a magazine within their financial resources, hence many good ideas have to be rejected, not because we disagree with them, but because we cannot pay for them.

Any Amateur is welcome to attend any Publications Committee meeting or to serve on the committee. The door is always open, so please come in!

—K.M.C.

D X

Sub-Editor: Bert Behenna, VK5BB.

Greetings fellow Amateurs! As your new DX sub-editor I find activity fairly low over the festive month of December. It will take some time to familiarise myself with this new chore.

I will make the plea to one and all, please send any news you may have on any piece of paper providing it has not been used previously.

Al VK4SS has been inactive except for a few contests, but has worked the following:

3.5 Mc.—W9ADN, WA6MGO, UA9PP (1300z).

7 Mc.—UP2KCA, VU2GG, DU1NL, YO9HF, OK1HA, OK1BY, OK1KB, MP4BBE, CN8FR, KP4BNI, ON5ZO, 5A1TW, HM1BW, G5DQ, G3PIT, G8AB, MP4TAS, UI8CK, 4S7RN, VS-9HAA, VQ4IN/VS9H, 5B4KN, 4X4DH, DU8RP, VU2PF.

20 mx c.w.: Ken VK3TL—AC5PN, CR8AD, GC2FMV, ET3GC, HP1IE, HZ2AMS, MP4QBG, SU1IM, SV0WOD (Dodecanese), VP2KJ (Nevis), VK9MD (Xmas), VP8GQ, 9Q5AB (Congo).

20 mx s.s.b.: Ken VK3TL—AC7A, PJ3AO, VP2KJ (St. Kitts-Nevis), VS9AKH, YN1LH, ZB1A, 5Z4F, 6O1KH, 3A2CP, 9Q5AB, HC8FN. Pete VK5FM—KC6BK, DM2AND, MP4PBQ, I1FBI, K6LCX, MP4QBF, UA4FP, UA6AL, UD-6BW, WA6SBO, WB6DEX (Boss Adey), UA-6KMP, I1CZE, SP5GX, LZ1DO, YO4AH, GM-2AR, GM2DQ.

15 mx: Al VK4SS—JT1CA, UA0KFG, UA0GH, OH1PN, SM5KV, VE7EH, UA9KDA, ZK1AR, KG6AAY (mostly around 0700z).

NEWS AND NOTES

Al VK4SS received VK/001 Certificate for 7 Mc. in 1962 OK Contest.

Is anyone working 28 Mc.?

BY1AD has been heard on 14 Mc. c.w. working stations outside Iron Curtain. Try 1000z.

TI2HP is first s.s.b. to have 300 confirmed.

VS4IH, VS4MD, VS4RS—all active on 14 Mc. c.w. from Sarawak (1000z).

TU2AU active 14050 kc. Operator is W8HMI (1400z).

QSLS RECEIVED

Ken VK3TL: YS1LA, 4U1SU (Egypt), FR-7ZC/T, ZP5CF, AC5A, AC5A/AC4, AP2AR, HZ1AB, YV0AA, VP2AV (Antigua), 5B4CZ, VP2SY, 9G1DY, YS1M, VP9BY, ST2AR.

SOME QTHs

SU1IM—I. Braham, 7 Roda St., Cairo (U.A.R.).
VQ8GQ—Via G3PAG.
VP2KJ—Via W4SSU.
SV0WDD—29 America St., Rodos, Dodecanese.
HC8FN—Via WA2WUV.
3A2CP—Via G3HPH.
9Q5AB—Via W2HMJ.
CE0ZI—Via W4QVJ, Box 3045, Jacksonville, Florida.
EI0RDS—Via I.R.T.S., 24 Wicklow St., Dublin 2, Eire.
FK8AU—Box 637, Noumea, New Caledonia.
KS6BA—P. Hodges, Box 307, Pago Pago, American Samoa.
HS1L—Via W7YB.
XW8AL—Via K4KT4.
VS4IH—B. Shirlow, C/o. G.P.O., Kutching, Sarawak, Malaysia.
KV4CE—P.O. Box 1511, St. Thomas, Virgin Is. of U.S.A.
HS1B—Box 1038, Bangkok, Thailand.
5N2LJM—C/o. Airport Commandant, Aviation Division, Kano Airport, Nigeria.
XW8AU—C/o. Box 46, Vientiane, Laos.

VK4JQ on Willis Is. is very active on 20 mx s.s.b., giving many a new country, seems to be very fair, and gives all a good go; nice to hear.

Would all accept wishes for '64. Please, would all who can give any assistance to this column do so. Thanks in anticipation. Thanks to Al VK4SS, Ken VK3TL and Pete VK5FM.

73, Bert, VK5BB.

V H F

Sub-Editor: Len Poynter, VK3ZGP.

No one can say that the v.h.f. enthusiasts did not make good use of their last months on 50 Mc. From mid November until mid January the 6 mx DX enthusiasts have had a field day. The activity during the Ross Hull Contest reached a peak around the 20th December and remained that way until the first week in January. All States were well represented, particularly VK8. This was to prove the highlight of the season for many operators who were able to work their first VK8 and complete the tally for 50 Mc. W.A.S.

From early indications at least 50 will make the grade, including your scribe who completed the deed after a three-year wait. This is nothing when compared with Rolo VK6BO who has patiently waited 14 years. At the height of the season numerous Amateurs ideally situated made W.A.S. in a matter of a few hours and repeated the effort on a number of occasions. Call areas VK1-2-4-5-6-7-8-9 were worked from VK3 and it is a pity VK0 was not available to present someone with a W.A.V.K. Call Areas—50 Mc. This could be a distinct possibility within the next few years.

Two metres was not living up to expectations and only two openings occurred. On Dec. 24 VK2ZKP and VK2ZCF worked ZL1AUM and ZL1ADE, and later in the month VK4-VK5 contacts were made, but nowhere near the opportunities as in previous series.

ZL openings were numerous on 6 mx right from mid November, throughout the season, until early January. Activity from VK3 reports was quite low from ZL. The N.Z. t.v. Channel 1 made it easy to monitor openings in this direction. We are still rather mystified by the reception of the t.v. at S9 plus level and not a sign of a ZL. One ZL4 appeared on a few openings but gather from reports only a few made contact.

A number of stations made the 1,000 mark during the contest. The general feeling that the period should still continue but submitting only a log for a seven-day period. It gives those not favourably located a chance to do good. However, it will be worth while seeing how the change in bands will affect those particularly in VK3.

432 Mc. opened solidly in most States on 1st Jan. First reports indicate quite good results. This column will be pleased to publish details of distances worked and records as they are made and broken. Who has worked the longest distance to date? The restriction on using only 432-436 Mc. portion will cause some change of plans for the t.v. enthusiasts, but this will be overcome in time.

Well so much for this month. With the big lapse in time since the season I hope readers will excuse the departure from normal routine. I trust some party or parties will be interested in the letter from KH6 (see Correspondence column) and will write for further information. Who will be the first lucky VK?

Don't forget those notes each month. Due to the new set-up, please confine your items to a resume of local activities. More detailed reports on 144, 432 and above would be in order. Time your letters to arrive by the end of the month. 73, VK3ZGP.

S W L

NEW SOUTH WALES

If January is an indication of months to follows, the VK2 Group should be in a better condition than for some time, as during that month correspondence has increased, which shows a greater interest. I would like to thank the following s.w.l's. for their letters: L2022, L2233, L2258, L2251, L2269, L2031. Norm L2251, an old Sydneylte, gone to VK4. Very pleased to hear of your whereabouts. When you get that aerial up, let me know of your DX.

Don L2022 writes of QRM bother, also of intending to get a new rx plus the erection of a better antenna. Hope you are successful in both ventures.

Ross L2233/VK4, in the Toowoomba area, has been on leave (Army Sigs), but reports that he has received his N.F.D. award; congrats. OM.

Sid L2258 reports having heard on 14 Mc. I1, YO, SV, KR6, KG6, G5, VS1, HB9, DL4, EA7, etc. The AMR300 must be really going well.

Chas. L2211 says that the v.h.f. season was the best for many a year. Best on 50 Mc. was VK8 in Darwin, plus a VK2 in Armidale and Inverell, both under 300 miles.

Several s.w.l's. took advantage of my offer of the booklet, "A Lot Depends on Your Aerial," and I trust they found the information very helpful. Copies are still available. Just send your request to me plus a stamp. If any member would like QSL cards printed at a very reasonable price, let me know, and it can be arranged.

Thought for the month: Learning only won't make a job safe. Safe application of technical know how will.

73, Chas. L2211.

DX LADDER

	Countries Conf.	Countries Hrd.	Zns. Conf.	S.s.b. Conf.	S.s.b. Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	272	38	20	104	35
A. Westcott	93	159	31	9	107	11
M. Hilliard	84	239	33	33	168	12
P. Drew	80	232	28	34	171	22
M. Cox	80	232	31	49	163	21
C. Aberneathy	57	100	31	—	—	—
G. Earl	46	142	25	25	119	5
N. Harrison	44	119	29	4	20	35
I. Thomas	42	139	20	16	97	14

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the

EDITOR "A.R.,"
P.O. BOX 36,
EAST MELBOURNE, C.2,
VICTORIA.

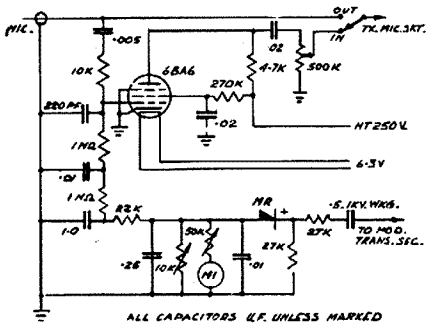
INCREASING TALK POWER

For Beginner or Low-Power Ham

This accessory of recent American origin will improve an average 30% modulated signal to more nearly 100% modulation. It can be connected between a crystal microphone and the rig as an outboard unit and can be switched out as desired.

The circuit uses a fast a.v.c. action, the control voltage being obtained from the secondary of the modulation transformer via the 0.5 μF. capacitor. This voltage is rectified by M.R. and after filtering, is applied as a negative voltage to the grid of the 6BA6 (a remote cut-off pentode). M1 is a voltmeter to set a reference level of —4.5v.

Referring to the rectified negative voltage, it will be seen that as modulation increases to 100% the negative voltage will increase, the time constant of the 6BA6 grid R/C network is designed so that the voltage does not undergo long term change, but varies rapidly at syllabic rate. In effect, the negative voltage on the 6BA6 grid is varying in sympathy with the syllables causing modulation, and this negative voltage depends on the percentage of modulation caused by the syllable.



W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6RU	2	297	VK3ATN	26	204
VK6MK	43	290	VK2JZ	61	201
VK3AHO	51	279	VK4HR	12	192
VK4FJ	21	270	VK4RW	23	186

Amendment:
VK3TL 62 141

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	318	VK2AGH	71	259
VK3CX	26	303	VK3ARX	66	236
VK2QL	5	298	VK5RX	23	230
VK4FJ	29	291	VK3AHQ	79	230
VK3NC	19	282	VK3RP	56	229
VK6RU	18	259	VK3XB	75	228

Amendments:

VK3RJ	42	212	VK3AXK	30	179
VK3JF	70	190	VK3TL	78	156

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	8	304	VK3AHO	76	282
VK2ACX	6	300	VK3HG	3	269
VK4FJ	32	299	VK3JA	43	252
VK2AGH	83	293	VK4HR	7	233
VK6MK	74	292	VK3BZ	4	231
VK3NC	77	283	VK3WL	45	225

New Member:
VK3SX 93 104

Amendments:

VK3HL	75	223	VK3TL	85	194
VK2VN	18	221			

—A. F. W. Haddrell, VK3ZFC.

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YOUTH RADIO CLUBS

Schools are back, which means the majority of the clubs are at work. If I leave myself out, can I get some supporters for a motion of hearty congratulations to those hardy teachers who teach kids all day and like them enough to come up for more in their lunch-time or after school when they carry on Y.R.C. work? To other club leaders—please don't write nasty letters. I like you just as much if you turn out in the evenings after a hard day's work.

We have spread even further. Mr. C. C. Hiew, who is Y.R.C. leader at Secondary English School, Pontian, Johore, Malaysia, is interested in developing correspondence between members of his club and club members in Australia. If you are interested, please write directly to Mr. Hiew. Australian club members could do a lot to help the Malaysian youngsters by sending circuits, technical articles, and club information. I hope you club leaders will push this hard, and also send a set of instructional sheets you may have done for your club. Photographs of your activities would also help.

During 1964, the Y.R.C. Committee will organise a contest to find the most efficient operator belonging to one of our clubs. It is hoped to build this contest into an annual affair with State champions competing, with due publicity, to be Commonwealth champion. Fuller details have to be worked out, but leaders should start preparing candidates. The boys will go for this.

Result of the Training Chart Contest in VK2 was: first prize to Susan Brown, of Booragul High and second prize to Glendon McLane, of Inverell High.

Doug Williamson (Bass High) reports 114 Elementary Certificates issued, including a batch of 6 from Christmas Island.

My other three readers (have you brought forth that mouse yet, P.S.?) will be glad to know that Chas. Taylor, teaching at a new high school at Clontarf Beach (Q.) wrote me a newsy letter—for which many thanks. He hopes to have his own call sign in a few weeks, and is interested in developing Y.R.C. activities in his area, with several secondary school and a Scouts group. Some schools there such as the De La Salle College have had a club for about a year, but the others are to be organised. Good luck, Chas.!

More club leaders are needed—there are fertile fields in many places waiting for you. Despite remarks above, relatively few schools have a leader for a possible club—you could help at lunch hour or after school or in the evenings or week-ends.

Few Scout groups have anything beyond very elementary radio. If you find any collection of youngsters, it's a fertile field and you can do a lot of good for all concerned.

73, Ken VK1KM.

RECEIVER DESIGN

(Continued from Page 5)

additional front-end gain was required, but would serve little use in providing additional front-end selectivity.

R.F. AMPLIFIER NOISE FIGURE

Another consideration in the evaluation of the front end of a communication receiver, especially at the higher frequencies, is the noise figure. The r.f. amplifier and the first mixer are the stages which determine the receiver noise figure. Numerous articles in the past have treated noise figure considerations, but let us briefly summarise a few of the more important points as related to the design of a low-noise r.f. stage.

A low-noise figure can be obtained through the use of low-noise tubes in the front end (e.g. 6BZ6 r.f. amplifier and 6U8 oscillator/mixer), and by obtaining a proper impedance match between the antenna and the grid of the r.f. amplifier. The gain should be just enough so that the receiver noise figure will not be affected by the succeeding stages. This will give the receiver the best rejection of cross-modulation, intermodulation and desensitisation, and at the same time yield the optimum noise figure.

SUMMARY

In closing, let us enumerate some of the important practices to follow in designing your own communication receiver front-end, or the points which should be considered in the evaluation of a commercial receiver:

1. The receiver should have at least one r.f. stage and two tuned circuits at the operating frequency. Two r.f. stages are desirable. The lack of an r.f. stage (antenna feeding directly to the mixer through a single tuned circuit) puts the receiver out of the "communication receiver" class.
2. Multi-tuned coupling circuits at the operating frequency will greatly increase the selectivity.
3. Thorough shielding of the r.f. stage should be employed to reduce the leak-through of undesired signals to the mixer.
4. Extreme care should be taken in the wiring layout. All signal leads should be kept short.
5. Filtering, decoupling and by-passing should be used on all leads in the front-end other than signal leads.
6. For best operation, r.f. stages should be neutralised. This is seldom done.
7. Care should be exercised in the choice of r.f. tubes to minimise interference effects. Some recommended tubes for r.f. amplifiers include the 6BZ6, 6EH7 and 6EJ7. The 6U8 makes an excellent oscillator/mixer tube, and yields a much lower noise figure than the common pentagrid converter tube. ●

W.I.A. (V.H.F.) W.A.S. RULES

1. This award has been created in order to stimulate interest in the v.h.f. bands and is of a high standard to fully acclaim the proficiency of the recipients on their v.h.f. achievements. The award is to be known as the W.A.S. (Aust.) Certificate and is to be issued to any Amateur in Australia or overseas who satisfies the following conditions.

2. The Certificate will be awarded for contacts on the 50 Mc. band and higher frequency bands. All contacts must be made on the same band and cross-band contacts will not be allowed.

3. Portable operation will be permitted provided that such portable location shall be within the same State and not more than 25 miles from the fixed location in the case of Australian stations, and in the same call area and not more than 100 miles from the fixed location in the case of overseas stations.

4. The applicant is required to submit verifications from the following areas of the Commonwealth of Australia:—

(a) New South Wales, Australian Capital Ter., or Lord Howe Is.
(b) Victoria.
(c) Queensland.
(d) South Australia.
(e) Western Australia.
(f) Tasmania.
(g) Northern Territory.

In all, seven (7) verifications are required.

5. Additional credit will be given for verifications from other overseas countries, say, New Zealand or the Territory of Papua and New Guinea, in the form of a sticker to be attached to the Certificate.

6. It will be necessary for the applicant to produce documentary proof in the form of QSL cards or other written evidence which completely verifies a two-way contact has been made. By completely is meant that the time and date, signal strength, type of emission used, location of the claimed station and the frequency used must all be clearly shown on the verification.

7. Contacts may be made using any authorised type of emission and must be in accordance with the current P.M.G's. Regulations or those applying in the country of the applicant.

8. Submitted verifications must be exactly as received and not altered or marked. Failure to comply with this rule will lead to the disallowance of that card and may lead to the disqualification of the applicant.

9. All applications must be accompanied by a list setting out the details required by Rule 6, and stating whether any of such contacts were made while portable, and if so, giving that location. Sufficient postage must be enclosed for the return of verifications to the applicant, registration being included if desired.

10. The verifications and list (Rule 9) will be addressed to the **Awards Committee, Box 2611W, G.P.O., Melbourne, Australia."**

11. The verifications so submitted will be examined by the Awards Committee, who will arrange for the successful applicants' names and call signs to be listed in "Amateur Radio". Certificates will be forwarded to successful applicants through Divisional Councils or direct to overseas applicants as the case may be.

12. The decisions of the Awards Committee of the W.I.A. in the interpretation and application of these rules shall be final.

13. Notwithstanding anything to the contrary, the Federal Council of the Wireless Institute of Australia reserve the right to alter these Rules from time to time as necessary.

W.I.A. 50 Mc. W.A.S. as at 6/2/64

Call	Cert. No.	Add. Cntrs.	Call	Cert. No.	Add. Cntrs.
VK4HD	27	8	VK3ZGM	40	2
VK4ZAZ	26	7	VK2ME	41	2
VK4ZBE	29	6	VK2ZCF	48	2
VK2WJ	13	4	VK2ASZ	50	2
VK3ZFM	22	4	VK5LC	1	1
VK3ZHF	25	4	VK6DW	3	1
VK3IM	30	4	VK2AEZ	10	1
VK9AU	32	4	VK3XA	11	1
VK4PU	35	4	VK3GM	12	1
VK2ABR	46	4	VK3ACL	14	1
VK4HR	4	3	VK3ZD	16	1
VK3PG	5	3	VK2HO	17	1
VK2ABC	8	3	VK3ZEA	18	1
VK2VW	9	3	VK7ZAQ	34	1
VK5GG	19	3	VK5ZBR	37	1
VK5ZAX	20	3	VK5KO	42	1
VK5ZBL	21	3	JA4IO	44	1
VK5BQ	23	3	VK4ZLC	49	1
VK7LZ	24	3	VK3ZGP	51	1
VK3QV	39	3	VK2WH	15	
VK4RY	2	2	VK5AX	36	
VK3ZGZ	28	2	JA1BYM	43	
VK5ZZ/7	31	2	VK4ZAA	45	
VK7ZAO	33	2	VK6ZAA	47	
VK5ZMK	38	2	VK5ZSG	52	

NEW CALL SIGNS

AUGUST, 1963

VK2NR—Dr. D. W. Boyd, 80 Lurline St., Katoomba.
VK2AVO—R. O. Chapman, 21 Kallaroo Rd., Lane Cove.
VK2ZBN—J. Bracken, 12 Walker St., Lismore.
VK2ZTS—L. T. Scotney, Lot 8, Hilltop Ave., Padstow Heights.
VK2ZTV/T—R. S. Gulson, 15 Pine St., Manly.

VK3EG—E. H. Gray, 218 North Rd., East Brighton.
VK3ER—G. S. Kiernan, Fiskville, via Ballan.
VK3FC—R. E. W. May, 24 Nethercote Drive, Mt. Waverley.
VK3MO—I. J. Williams, 24 Lauriston St., Kyneton.
VK3PE—E. Sundstrup, 10 Valley Cres., Glenroy.
VK3ZPM—P. J. Markman, 8 Purches Ave., Pascoe Vale South.
VK3SJ—A. J. Sims, Gipps St., Yarram.
VK3ZAE—P. O'Shannessy, 19 Kilpatrick Ave., Shepparton.
VK3ZRL—W. R. Dickson, Lot 8, Coghill St., Broadmeadows West.
VK3ZRO—R. W. Duckworth, 78 Ringwood St., Ringwood.
VK3ZSD—M. S. D. Fleer, 13 Pascoe Rd., Boronia.

VK4FV—B. A. Stevens, Station: Army Married Quarters, Greenbank; Postal: 401 Sig. Regt., Greenbank.
VK4JZ—R. J. Zimitat, 10 Cyprus St., North Ipswich.
VK4ZCM—S. B. McGregor, 39 Conley St., Clontarf.
VK4ZTW—W. A. Tomlinson, Hendry St., Tewantin.

VK5EO—E. H. Crail, 41 Minkie Ave., Mitchell Park.
VK5HO—J. R. Haskard, Oakbank.
VK5VF—The Wireless Institute of Australia, Station: Pine Lodge, Mt. Lofty; Postal: Box 1234K, G.P.O., Adelaide.
VK5ZDH—R. A. Jackson, 62 Shillabeer Ave., Croydon Park.
VK5ZJP—G. J. Perry, 131 Caulfield Ave., Clarence Gardens.
VK5ZRG—G. R. Graetz, 82 Paxton St., Willaston.
VK5ZYX—R. B. Broad, "Pine Lodge," Summit Rd., Mt. Lofty.

VK6OK—J. F. O'Keefe, 36 Lenore Rd., Gooseberry Hill.
VK6ZAM—J. P. Morgan, Christian Bros. School, Highgate.

SEPTEMBER, 1963

VK1RD—R. Davis, 14 Hovea St., O'Connor, A.C.T.
VK1ZAC—A. M. Campbell, C/o. Dept. of External Affairs, A.C.T.

VK2ATT—J. M. Pattison, Orana, 407 Marrickville St., Dulwich Hill.
VK2ATU—E. A. Parker, 10 Park Ave., Springwood.
VK2AVR—L. E. Thorne, 25 Harefield Close, Epping.
VK2ZGB—J. C. Bennett, 63 Princes Ave., Roseberry.

VK3ARQ—C. J. Micallef, 5 Renown St., Coburg.
VK3ZAS—R. A. Simmonds, 32 Yongala St., Balwyn, E.8.
VK3ZCE—J. A. Cullin, 18 Baden Powell Drive, Frankston.
VK3ZOU—J. C. Spence, Scotch College, Glenferrie Rd., Hawthorn.

VK4GW—G. S. L. Ward, 23 Ruth St., Corinda, Brisbane.
VK4US—Queensland University Squadron, C/o. R.A.A.F. Centre, Alice St., Brisbane.
VK4WK—A. G. J. Ward, 37 Dale St., Maryborough.
VK4WN—J. C. Willis, R.A.A.F. Base, Amberley.

VK6FX—W. A. Fulton, Flat 4, 159 Labouchere Rd., Como.
VK8ZBD—R. S. Watkins, 48 Cobden St., Bayswater.

VK7ZTC—A. B. Carter, 22 Keane St., Launceston.
VK7BL—B. R. Barnes, Quiggins Rd., Wynyard.
VK7BB—A. E. Byrne, 30 Arthur St., Poatina.
VK7LT—L. M. Tongs, 3 Ashburner St., Devonport.

VK9BN—B. R. Newman (Rev.), Mendi, Southern Highlands, T.P.N.G.
VK9CA—M. McBride (Rev.), Mendi, Southern Highlands, T.P.N.G.
VK9GC—A. H. Sandilands, Bishop St., Rabaul.
VK9GL—G. J. Lunney, P.O. Box 1029, Boroko, Pt. Moresby.
VK9HG—H. J. Hicks, P.O. Box 251, Lae, T.P.N.G.
VK9MD—D. A. Morgan, C/o. British Phosphate Commission, Christmas Is., Indian Oc'n.
VK9XI—Christmas Island Amateur Radio Club, Christmas Island, Indian Ocean.

OCTOBER, 1963

VK2ANP—J. H. Collister, 116 Hillcrest Ave., Greenacre.
VK2NA—Narrandera Radio Club, 50 Larmer St., Narrandera.
VK2AIC—R. H. Seales, Taylor Rd., Fern Bay.
VK2AIP—J. M. Burton, Glen Leigh Rd., Glen Innes.
VK2ALI—A. J. Pearce, 7 Eltham St., Dulwich Hill.
VK2ALL—E. L. Lloyd, Station: vessel "Noelani"; Postal: 7 The Bulwark, Castlecrag Station.
VK2AYN—R. W. Huband, 44 Memorial Ave., Blackwall.
VK2ZNH—N. Hawkins, 121 Fiddens Wharf Rd., Killara.
VK2ZWJ—M. J. Wallace, Flat 8, 748 New South Head Rd., Rose Bay.

VK3VW—V. W. Stallan, 19 Vincent Cres., Werribee.
VK3ZAQ—B. J. Swingler, 6 Norville St., East Bentleigh.
VK3ZDW—L. A. C. McCosker, 20 R.T.C. Radio S.C.L., R.A.A.F., Laverton.
VK3ZEK—J. E. Kershaw, 5 Merlyn St., Footscray.

VK5CW—C. Hagoort, Larkdale Ave., Sydenham.

VK7NZ—Wireless Institute of Australia, Tasmanian Div., Northern Zone, 102 Charles St., Launceston.
VK7GK—G. K. Rieger, 98 Springfield Ave., Moonah West.

VK8ZMD—A. M. Dunn, 742 Dempsey Place, Rapid Creek, Darwin.

NOVEMBER, 1963

VK1AG—G. T. Allen, 7 Hedley St., Hackett, A.C.T.
VK1CX—B. H. Wall, 191 Duffy St., Ainslie, A.C.T.

VK2GR—G. E. Riley, 6 Baringa Rd., Mortdale.
VK2MG—Bathurst Radio Club, Webbs Chambers, 171 George St., Bathurst.
VK2TO—T. Olrog, 1/4 Bannerman St., Cremorne.
VK2AUJ—A. L. Robinson, 97 Hamilton Rd., Fairfield.
VK2AUV—B. J. Kirkwood, 3/8 Baden Rd., Neutral Bay.
VK2AUW—P. R. Crosthwaite, C.S.I.R.O. Radio Telescope, Parkes.
VK2AVZ—G. W. Vaughan, 126 Archer St., Roseville.
VK2AXC—Cessnock Amateur Radio Club, Cr. Allandale and Wollombi Rds., Cessnock.
VK2AZA—R. M. Marsden, Station: 11 Trafalgar Rd., Tuross Heads; Postal: 43 Houston Rd., Kingsford.
VK2ZAJ—W. L. Riis, 1 Sears Ave., Raymond Terrace.
VK2ZIW—A. H. Wass, 1 Cannons Pde., Forestville.

VK3AAW—Warrnambool & District Y.M.C.A. Youth Radio Club, Cr. Lava & Henna Sts., Warrnambool.

VK4LL—L. F. Coyle, 18 Burrum St., Bundaberg.
VK4LV—B. E. C. Lavender, Flat 4, 28 Stopford St., Wooloowin.
VK4SE—L. S. Stratford, Station: Marshall St., Goondiwindi; Postal: P.O. Box 110, Goondiwindi.
VK4ZRM—R. M. O'Malley, 13 Belair St., Annerley.

VK5NH—Nailsworth Boys' Technical High School, Rakes Rd., Nailsworth.
VK5ZFC—A. E. Cooling, 20 Blencowe St., Elizabeth Grove.
VK5ZKR—C. M. Hutchesson, Yahl, via Mt. Gambier.
VK5ZNT—W. N. Thomas, 15 Keevil St., Elizabeth North.
VK5ZRB—R. S. Bowman, Beau View, Parrakie.
VK5ZRR—R. R. Marks, 19 New Belair Rd., Torrens Park.

VK6GL—E. L. Gooding, Darkan.
VK6LX—L. J. Symonds, 48 Williams Rd., Kalamunda.
VK6ZBM—B. J. Byrnes, 4 Crowther St., Carnarvon.
VK6ZBN—A. R. May, 11 Rene Rd., Nedlands.
VK6ZEA—L. Jessop, 17 Victoria St., Sth. Perth.

VK8HI—L. G. Reynolds, Station: O.T.C. Radio Station, Darwin; Postal: P.O. Box 288, Darwin.

SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R.," and back copies may not be available upon request. To preserve continuity of your files of "A.R.," please pay your annual subscription now.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

AUSTRALIAN D.X.C.C.

Editor "A.R.," Dear Sir,

Now that the elusive 300 mark has been reached in all the three sections of the above, I would firstly like to congratulate all the members who have obtained that very creditable tally.

I would also like to pay tribute to our Awards Manager (Alf VK3KB), who is doing such a mighty job and we should be thankful to him for the up-to-date lists of D.X.C.C. countries published from time to time. Thanks also to "A.R." for publishing these lists—something that is not even printed in the big noise oversees magazines.

After studying the latest list in "A.R." (Jan. 1964) some rather startling facts are noted. We now appear to have a total of 339 countries acceptable for the Australian D.X.C.C. Another has since been created by the A.R.R.L., but not yet on our list, so today there is 340.

Now off this number we must take two, the Leeward and Windward business, so if you were lucky enough to be licensed prior to 1/4/49 when VO was deleted it is possible for a total of 338 to your credit.

Since 1/4/49 of these 338, a total of 27 countries—C9, CR8, ET2, FF8, FI8, FN, FQ8, II, 15, JZ0, PK1-2-3, PK4, PK5, PK6, UA0, UN1, VO, VP2, VP2, VQ6, VS1, VS4, ZC5, ZD4, 9M2, 9S4, 9U5—have been deleted from the list, so if you are unlucky enough to be licensed today or in the future, there is only a total of 311 countries which you can work for the D.X.C.C.

A present-day licensed Amateur must feel proud to think he is so much better than these "old timers" prior to 1/4/49 that he is asked to concede to them a handicap of 27 in a total of 338-?? so that they have a chance to compete against him or retain their place in the top twelve listing.

But seriously, is it not time that something different was done to make the D.X.C.C. more interesting to everybody concerned?

I am prepared to say that as long as the top group of stations listed today stay interested in the D.X.C.C. that nobody starting today can dislodge them from these positions. Candidly this, in my opinion, is a poor state of affairs and can only lead to disinterest by most DX Amateurs, particularly the younger members of the W.I.A. A young Amateur who starts looking towards getting to the top of the listing surely must say to himself what's the good I haven't a hope, and he is right, he hasn't, while we list the totals as we do today.

I think it is time to change the listings to a two-total, similar to the A.R.R.L. First list the number worked out of the present available countries, the order being arranged from that total, the second number being the total number of countries ever worked by that particular station, e.g. 255/270 D.X.C.C. being awarded from the second number. This will then not upset the tally of any member working for D.X.C.C.

One objection that will be raised to this idea is the extra work involved and imposed on the Awards Manager, but I do not think this would be very great, the double listing would only apply to the highest twelve in each section and once done would be complete for all time. Thereafter it would only need to be done to any new station as from time to time a new call appeared in the top twelve of each section.

I feel if the double listings were adopted it would create more interest and would certainly make it much fairer to the younger Amateur by putting both the earlier licensed Amateur and the present-day ones on an equal footing.

Finally, in case anybody gets the idea that this is for my own personal benefit, let me tell them right here that it will affect my total quite a bit and will be to my own disadvantage, but wherever I end up on the phone listing, I would be a lot happier to lose those countries credited to me, which have now been deleted and to know that everybody was on an equal and fair footing.

—Bram Jellett, VK5AB.

ROSS HULL MEMORIAL CONTEST

Editor "A.R.," Dear Sir,

Intending to follow a 10-year practice of having a few DX contacts on 6 metres to renew old friendships, acquire new ones, exchange numbers and greetings, technical ideas and a little light conversation, on Boxing Day I switched on the 6 metre receiver.

The band was wide open with signals coming in from everywhere, but the activity was concentrated into the first 300 kc. of a band 4 Mc. wide. Like holiday campers who feel compelled to cram themselves into a small section of a large recreational area due to inherent love of neighbours, these operators mingled with the intimacy of eggs and bacon. No receiver could disentangle them. Occasionally one signal would stand out in splendid isolation and a voice would be heard crying "Your number received, wish you all you wish yourself, will QSL via the Bureau, 73, VK so and so now off and clear; CQ, CQ, DX."

Many of the old-timers were there awaiting the "treatment" like posts to be processed by itinerant dogs. Probably the understatement of the year was made by a polite and conventional VK5 operator well versed in the accepted operating procedures of the high frequency bands when he said, "Their method of using the v.f.o. on this band is rather unusual." More bluntly expressed—when not engaged in Amateur Radio activities these users of the "slick whistle" spend their time searching for mythical parents.

The contest virus spread to 2 metres where at the cost of a numerical inoculation one was allowed to wish the other fellow a brief seasonal greeting with a request to repeat the salutation on 6 metres and any other band in the v.h.f. spectrum one might happen to operate.

And all this to honour the memory of that fine Amateur operator and experimenter, the late Ross A. Hull. If this is the way the modern Amateur sees fit to pay homage to that illustrious gentleman, I would prefer to die a non-entity.

After an hour's listening to what might be mistaken for an auction sale or the dog pavilion at a country fair, I switched off and improved my mind reading to the accompaniment of the comparative music of a neighbour's lawn mower.

I should like to use your valued magazine, Sir, to convey my good wishes to my many friends I did not contact on 6 metres.

—H. A. F. (Adrian) Rofe, VK2HE.

ASSISTING BEGINNERS

Editor "A.R.," Dear Sir,

I must agree with Chas WIA-L2211 in his letter in December "A.R." Last year I made an appeal on behalf of some s.w.l's. and received three replies which were very helpful, although I was not able to make full use of the offers of assistance.

I feel the s.w.l's. or beginners would be helped more if the W.I.A. could produce a booklet, either typed or printed, giving a fairly comprehensive, accurate and easily understood outline of radio. There are many radio books on the market, all of which contain much valuable information to the more experienced listener.

Too many of the American books contain comparatively simple circuits, yet some particular parts, mainly coils, are not obtainable here nor are the details given. Tuning condensers vary considerably and standardisation of coils and condensers for simple s.w. sets would be a great help.

There is much information at hand. It should not be hard for a group of Hams to produce details of several simple, standard, easily constructed sets. This would save many beginners from losing heart and help to create greater enthusiasm in the S.w.l. Group and Youth Radio Clubs.

—Harry Major, WIA-L3102.

A CHALLENGE FROM KH6

Editor "A.R.," Dear Sir,

The members of our society, the Microwave Society of Hawaii, have long felt that the record-smashing 144 Mc. contact between Hawaii and California was only the beginning, and that the temperature "duct" phenomena responsible for this contact has not been exploited to the fullest extent possible.

It has been our feeling that under the proper conditions, a 144 Mc. contact between Australia and the Hawaiian Islands would be possible. Recent meetings with KH6UK, the present record holder, tend to strengthen this feeling, in that he too is convinced that such a contact is possible, provided that suitably equipped stations are available for tests.

We know that the temperature "duct" extends beyond Hawaii, to the west and south. It is doubtful, however, that this duct would extend to the equator. It is also known that such conditions also occur in the southern hemisphere during certain times of the year. It is our sincere belief that if certain favourable conditions prevail at a given time, on each side of the equatorial belt, that a 144 Mc. contact is a distinct possibility.

After much consideration, we wish to issue a challenge to the Australian v.h.f. enthusists, to attempt such a contact and maintain regular schedules with this station, KH6CMM.

KH6CMM is ideally situated for such an attempt, as the station is located only a few hundred yards from the ocean, with an unobstructed over-water path to Australia and or New Zealand.

Equipment employed at this station is considered excellent, by any standards. A transmitting converter provides 144 Mc. c.w. or s.s.b. output to drive the final amplifier, Eimac 4CX300As running one kilowatt d.c. input. This amplifier is a copy of that which originally appeared in the February 1960 issue of "QST" magazine. Power output is on the order of 650 watts on s.s.b., and 800 watts on c.w.

The receiving system at present consists of the popular "W2AZL converter", using cascode 417As, followed by a Collins 75A-4 receiver. However, we are now experimenting with the 7077 planar triode, and this, in conjunction with a lo-noise Nuvistor mixer, shows promise of being a superior converter. If this does prove to be the case, the 417As will be placed on the shelf. In either case, a 50-c.p.s. audio filter is available for weak-signal c.w. reception.

The antenna system, now under construction, is a time-proven array. It consists of four 15-element 24-foot Yagis, spaced two wavelengths, and provides 24.5 db. forward gain. We hope to install this array, horizontally polarised, on a 70-foot pole.

In addition to our 144 Mc. activities, KH6CMM and myself are also active on 50 Mc., running a full kilowatt on c.w. and s.s.b. The antennae are 6-element 24-foot Yagis, providing 15.0 db. forward gain. At each station, 7077 planar triode converters with 1.0 db. overall noise figures are employed ahead of a Collins 75A-4.

It is our hope that 50 Mc. TE propagation may again be possible between Hawaii and Australia during the spring and summer months, and we would welcome schedules on this band, as well as on 144 Mc.

Please mention this letter to some of the more serious individuals or groups, in hopes that someone might accept our challenge. Interested parties should contact us at 59-216 Kam Hiway, Sunset Beach, Oahu, Hawaii, for further information, and should include a brief outline of their equipment.

—P. G. Roemer, KH6CMM, President, Microwave Society of Hawaii.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

FEDERAL CONSTITUTION ALTERATION

Federal Executive, on behalf of the Federal Council of the Wireless Institute of Australia, hereby gives notice that it is intended to alter the **Federal Constitution of the Wireless Institute of Australia 1947** as follows:—

(a) Delete Clause 21 and substitute—

"21. The Headquarters Division shall call for nominations annually from its members for appointment to the Federal Executive, such nominations to be received not less than 60 days prior to the conclusion of the fiscal year. The nominations which shall include the names of any retiring members of Federal Executive willing to re-nominate shall be submitted by the Headquarters Division to Federal Council for the appointment by preferential vote of seven members, two at least of whom shall be retiring members."

(b) Insert new Clause 21a—

"21a. The new Federal Executive shall take office at the conclusion of the Federal Convention which they shall attend, or where a Federal Convention is not held, within one month of the conclusion of the fiscal year. The Federal Executive shall determine its own offices in such manner as considered necessary."

(c) Delete Clause 24 and substitute—

"24. The appointment of Federal Executive which shall be finalised by the Headquarters Division not less than 14 days prior to the conclusion of the fiscal year shall be notified in writing to Federal Council prior to the conclusion of the fiscal year. The Federal Executive shall notify Federal Council in writing of the offices and appointees thereto within 28 days of the commencement of the new fiscal year or the Federal Convention whichever is the sooner."

Any member of the Institute not in agreement with the proposed alterations should notify his disapproval and the reasons to the Federal Secretary within 14 days of the publication of this proposal.

CALL BOOK MAGAZINE

The Federal Treasurer, W.I.A., has for sale at £1 post paid some recent back numbers of this directory of Amateurs. Only the American edition, listing K and W calls, is available at the moment. Apply Bob Boase, VK3NI, 50 Cardigan St., Carlton, Vic.

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FEDERAL QSL BUREAU

In these notes in the January issue it was stated that Graham VK2AGH was handling cards for VK4JQ, Willis Island. This is NOT correct. The QSL manager for VK4JQ is W6HYG. Graham, however, is handling QSLs for VK4HG and VK4WV, ex Willis Island.

The box number of the Hungarian QSL Bureau has been changed. The new address is: Central Club of Hungarian Radio Amateurs, P.O. Box 214, Budapest 5, Hungary.

Copies of "CQ" for 1963 are available from this Bureau for free. First applicant gets them for postage. Do not send postage with application. Successful applicant will be advised of postage required.

Any station needing American Samoa on c.w. should look for K7VAX/XS8 around 0530z on 14065 kc. Bill, who is a teacher in Pago Pago, is on daily and will be there for at least two years. He has a good signal, but his operating speed is limited to 10 w.p.m. Full QTH is Box 458, Pago Pago.

After almost a month of light mail, incoming cards thickened up considerably over the Xmas week, to bring the December total to over 5,000 cards.

Was pleased to see Bruno Bossert, HG9QO (QSL notes Jan. "A.R."), in Melbourne during Xmas and New Year. Bruno will return to Sydney for a few weeks before settling in Melbourne for the remainder of 1964. Another Swiss Ham, Fred Beusch, ex HB9ABI and ex VK8HB, presently in Sydney, expects to visit Melbourne early in 1964. His movements thereafter are still uncertain.

Frank Hine, VK2QL, QSL manager for VK2 Division, is anxious to obtain the present address of VK2FR who was on Lord Howe Island for some time. He has apparently left L.H. and no forwarding address is known. Inform Frank, care Box 1734, G.P.O., Sydney.

The Federal Bureau is in receipt of a bundle of cards from the Austrian Bureau, addressed to OE1IW. His name is Karl Kriwanck and he is apparently now in VK. Any info as to his present QTH to the Federal QSL Manager please.

—Ray Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

During the holiday period, activity on the v.h.f. bands has shown an increase and there has been some worthwhile DX, especially on 6 mx. Those responsible for much of this activity are Kev 2ZKW, Mac 2ZMO and Stuart 2AYF. In addition, a real first was scored by Des 2ZDN when he worked Sydney on 432 Mc. Considering the short time which has been available on this band, Des must be congratulated for his pioneering work. Not all contacts have been conducted on v.h.f., however, as many of the h.f. boys have been re-building and testing the gear. Harold 2AHA has finally managed to get "Big Bertha" on the air, running several watts of sideband to an 813. Reports are that this is a potent signal and Harold is pleased with the lack of t.v.i. Frank 2FC has had some success with the series gate modulation, but he claims that it is still capable of improvement. He is looking for some information on the system from someone who has used it successfully.

Otto 2SI is still battling with his Rothman system which was found to be unsatisfactory with a pi coupler. There were also some modulation troubles at 2AWX, but these have been resolved and the signal now sounds a little better. Now a man of considerable leisure, Jack 2KQ is thinking about being a regular user of the bands, his signal on 80 being the customary S9. Bill 2ZL still watches the one-eyed monster in preference to listening to the Monday night broadcast, but as soon as he has all the answers to the quiz questions, he'll come back to the fold. Bill 2XT is not sure whether to put s.s.b. or a.m. in the new car since the amount of room is not as great as in the previous vehicle and time between refits and conventions is all too short. Chris 2PZ has some aerials on the German monster but no Amateur gear as yet.

It was pleasing to see that second and third prizes for the two mx hunt at the State Convention were taken out by Les 2RJ and Bill 2XT. This proves their ability as jigsaw puzzlers is above average. According to all reports Lionel 2CS is never at home these days and he was heard to remark the other day that since he has retired he's been wondering how he ever made enough time to go to work!

Don't forget the next meeting of the Branch is the Annual General Meeting and Election of Officers for 1964. This will be held in Room 15, Classroom Block, Newcastle Technical College on Friday, 6th March, at 8 p.m. As well as the election, some other entertainment has been arranged, so come along and bring some hecklers with you. Don't let them have it all their own way. See you there, 73, 2AKX.

CANBERRA RADIO SOCIETY'S EASTER CONVENTION

The committee of the above Society has decided to organise an Amateur Radio Convention at Canberra in the coming Easter week-end. The programme is as follows, the times shown being subject to minor changes.

Friday, 27th March: Midday to 6 p.m.—Mobile Contest, submit logs for any two-hour period with the last QSO logged, being made inside VK1. 7-11 p.m.—Gathering at the Society's Club Rooms (VK1ACA). Tea and coffee, etc., will be available and possibly films of interest will be shown.

Saturday, 28th March: 11 a.m.-12.0 p.m.—Picnic lunch at Cotter Dam Reserve. 12.30-1.30 p.m.—Rx sensitivity contest (details see below). 2.30 p.m.—Hidden Tx Hunt at Cotter and district (h.f.). 4 p.m.—V.h.f. Fox Hunt (inside Canberra). 8 p.m.—Dinner at the "Ren of Canberra".

Sunday, 29th March: 10 a.m.—Visit to A.N.U. Nuclear Physics. 2-3 p.m.—All-band Scramble. 3-6 p.m.—V.h.f and/or H.f. Fox Hunt, followed by Hidden Tx Hunt. 8 p.m.—Visit to Mt. Stromlo Observatory.

Monday, 30th March: 10 a.m.—Visit to Belconnen, the Naval Radio Base, housing the most powerful tx in VK land.

Details: Logs from Friday Contest are to be given in by 7 p.m. at the Club Rooms at Riverside, Kingston.

Rx sensitivity contest: You will be at the Cotter Reserve in the gully where receiving conditions are bad. A tx will have its power gradually reduced as phone code messages will be sent at specified intervals. Any antenna is allowed.

Accommodation: It is rather late but we hope that by this time most of the accommodation will have been fixed up through George VK1GB. Send a deposit of £4, stating what accommodation is desired to VK1GB, Dickson, A.C.T.

To find the Club Rooms, proceed east from the front of Parliament House, across a dual carriage way (King's Avenue) and W.I.A. signs will direct you from there.

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VICTORIA

WESTERN ZONE

We heartily welcome two new call signs to the Zone, Brenda 3KT and Harry 3ZX, who qualified for the full ticket. Brenda is John 3AFU's XYL from Clear Lake and Harry hails from Horsham. Mac 3AZM (Horsham) had the misfortune to lose his Bendix freq. meter in a recent fire. Bill 3AKW (Lubeck) is at last connected to the S.E.C. mains. Rodney ex 5CU, now 3UG, is permanently residing in Melbourne—works at the same QTH as Gordon 3GW, ex Rainbow, and about fifteen other Hams, including Ron 3OM. Neil 3AQD (Ararat) has completed his new shack and is radiating an excellent signal therefrom on 80 mx, running about 60w. to parallel 807s.

David 3ADS (Glenorchy) has replaced the ground plane with a dipole with satisfying results. Both David and John 3AFU are busy boys these days with C.F.A. networks, but still find time to appear on our Zone hook-ups. Merv. 3AFO (Horsham) has been brass-pounding of late in an effort to get Alex, a Horsham s.w.l., up to Amateur standard. Aged only 16, Alex has already passed all theory papers, so we are tipping another Ham will be in the Zone before long. Vic 3AKJ (Horsham) steamed up a Type 3 on 80 mx the other night. The first QSO for about seven

years. Welcome back, Vic. Another Vic., 3AEQ (Murtoa) is busily engaged in re-vamping a heavy duty power supply, but due to pressure of business these days finds it hard to keep at it. 73, 3AFO.

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QUEENSLAND

WIDE BAY & BURNETT BRANCH

Jimmy 4HZ has been on holidays again—how that young fellow gets around! Lee Downing persevered with the morse key and the P.M.G. rewarded him with a call sign of 4FX, and Dudley Lynch was successful at his theory examination. Here's my hand boys.

Harry 4ZHG shut up shop for the festive season and hied himself off to the Gold Coast, hob-nobbing with the V.I.P's. and the mermaids, although he would not have much chance to date them as his XYL (Audrey) and the harmonics went with him. Since he has been back home, the spiders are spinning webs in the rig as he is busy building a boat. Perhaps he is still thinking of those mermaids.

The Youth Club has re-commenced again after the holidays, but associate John Lind, Harry's instruction partner, and 2 I.C. of the electrical distribution in this centre, has been transferred to Brisbane (maybe to sit in the manager's chair) so that leaves Harry doing the instruction on his own. So he has the junior boys one week and the seniors the other. It helps to keep him out of mischief and his mind off the mermaids.

Bill Tomlinson, of Tewantin, who is now 4TW, is too busy to use his call sign. He is flat out keeping other people's square eyed monsters perking. He should slow up and live longer. They say only the good die young, so he should be right for a few years yet. 73, Fred Cox.

TOWNSVILLE AND DISTRICT

With the advent of the Ross Hull Contest, I must say that the boys in the south are having a field day almost every other day. The QSO numbers being exchanged by some of them are really fantastic, when one looks back to the past contests. Sorry to report that these fantastic openings are not for the north. Personally I have only managed 28 QSOs for approx. 80 hours operating. At long last managed to work a VK8, so have only to hear and work a VK6 and then I can worry Alf 3KB to send along the necessary award. Alf will have to work overtime getting the awards out as some say that they have W.A.S. every few days. Congrats. to some of the newcomers that have earned this award as I have been trying for five, or is it seven, years.

The other bands are not yet open wide, maybe due to the extra high noise level. Only four local stations heard now on the band. Wonder what has happened to them? Charlie 4BQ and family up on the Tablelands for the holidays, while Owen 4OV and his family are all the way in from Mt. Isa to spend the vacation on Magnetic Island. Ere this is read, I will be on my annual pilgrimage to Melbourne and all points north. Must try and miss the onset of the wet season, maybe a cyclone if predictions are correct. 73, 4RW.

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TASMANIA

Remember to vote at the forthcoming Council elections. We hope to see you at the Divisional Dinner to be held at Launceston on Saturday, 21st March, 1964; the Northern Zone is arranging matters this year and we confidently expect a very wonderful event, so do not miss it.

December and January have been months for mobile and portable work, despite the very windy weather. Stations heard away have been Ken 7KH, Jack 7JB, Terry 7CT, John 7JF, Harold 7MZ, Lee 7KC, Snowy 7CH (mobile marine), Den 7DK and 7ZMH. We have also had some DX visitors. We were pleased to meet Guy and Alain who operated FB8YY at Adelie Land, and I personally rejoiced at the opportunity to speak French with them and thank them for their patience. The other DX visitor was Charles K2BOZ, a s.s.b. fiend on 20 mx, aboard the U.S.S. Glacier, which called at Hobart early in February. Charles gave us a delightful and much appreciated impromptu address at the February general meeting of the Division.

Lee 7KC has successfully got operating a one-watt s.s.b. rig and it sounds good too. Finally, a personal comment. Thanks to Michael 7ZAV, who wrote the monthly notes while I have been out of action with my injured hand. The fact that I contribute these notes indicates that I am well on the way to a full recovery after the lapse of six months. I thank all those who so kindly helped me, whether by visits or by QSO, during my enforced idleness. I especially thank Ken 7KA who loaned me a ham-band receiver for use in the hospital, and David 7ZAY and Ted 7EB who visited me regularly. Thank you chaps, one and all. With very 73, 7ZZ.

NORTH-WEST ZONE

First meeting of the year has been held, and if the attendance is an indication of things to come, it looks a very promising year in store. We were pleased to welcome visitor 4KX and Reg 7ZAO, who has been transferred in his job from the southern zone. Also present was Athol 7LR, who unfortunately has little spare time for Amateur "doings", but is always there to lend a hand when needed.

Big event of the month is the N.W. Hamfest to be held at Port Sorell. At the time of writing this promises to be a very good day's outing and much time and effort have gone to this end, particularly on the part of organiser Basil 7BL. Even the tide has been organised to allow cricket to be played on the beach.

Some 2 mx DX has been worked recently and some DX on 40 and 20. Concern has been expressed at the number of "Commercials" on 80 mx. How about that I.T.U. Fund donation? Believe Athol 7SW is back on the air after all that flap about t.v.i. Sorry to hear associate Ernest Greenhall is ill in hospital. Wish you a speedy recovery, Ernest. 73, 7ZBH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received at **P.O. Box 88, East Melbourne, C.2, Vic., by 8th of the month,** and remittance should accompany the advertisement. Call signs are now permitted in Hamads. Dealers' advertisements not accepted in this column.

FOR SALE: AR88D Rx, £90. Geloso 222TR Tx, £90. Both in mint cond., had little use. Offer? VK3ANV, Box 239, Bairnsdale, Vic.

FOR SALE: Collins equipment of the late VK3JK. 32S1 Transmitter, £345. 75S1 Receiver, £345, or offer. All offers in writing to W. L. Jackson, VK3XM, 23 Malane St., Ormond, S.E.9, Vic.

FOR SALE: Gear ex late VK3QK: Eddystone 888 Receiver, new condition; BC457A Command Xmitter (7 Mc.); SCR522 Transceiver, with genemotor supply; Kingsley KS9'er; Type 109 Transceiver; Link Receiver F/M type 1305, tuned Channel 5 (new); CPR55 Range Indicator; Xmitter Tuning Unit TU9B; 109 Power Unit MK. II.; Dynamotor type DA1A; Roof Indicator Unit Y10QB/5000; W/T Set 109 Mk. II.; 230-200 volt Transformer; complete home-built a.m. 150w. Transmitter, Geloso v.f.o., t.v.i. proof, with power supply in rack; Dynamotor Unit PE94B; plus miscellaneous valves, sockets, etc. All equipment in working order. Best reasonable offers accepted. Contact Arthur Evans (VK3VQ), phone 99-2817, or Arthur Tinkler (VK3ZV), phone 29-3446 (Vic.).

FOR SALE: Complete home-built Geloso v.f.o., plate and screen modulated Transmitter; and R107 Receiver. Also Type 3 Mk. II. Transceiver complete. In good order, offer? Equipment of ex late VK3CH. C/o. N. Harris, 1 Duncan St., Birchip, Vic.

FOR SALE: Hallicrafters SX111 Rcvr., 80 thru. 10 metres and WWV, a.m., c.w., s.s.b., selectable sideband, large slide-rule dial, 0.5 to 5 Kc. selectivity, xtal cal., noise limiter, notch filter, as new condition, £190. VK2DM, 40 Ware St., Fairfield, N.S.W. Phone 72-5601.

FOR SALE: Model 840C Eddystone Comm. Receiver, 480 Kc. to 30 Mc. Excellent condition. Price £65. Mrs. J. Anderson, 14 Moore St., Toronto, 2N, N.S.W.

FOR SALE: Trans. Cabinet, ducoed grey, 68" high, 22" deep, 26" wide, price 30/-. Smaller Cabinet, ducoed grey, 20/-. Power Supply parts; back issues of "QST", "CQ" and "Short Wave Magazine"; text books. VK3DM, 110 Francis St., Ascot Vale, W.2, Victoria. Phone 37-4071.

FOR SALE: Wagner Sideband Transceiver, covers 80, 40, 20, 15 and 10, upper or lower sideband, break-in c.w. with audio tone monitor, 2.1 kc. mechanical filter, two v.f.o's. with 1 kc. accuracy, built-in vox, p.t.t., xtal cal., "S" meter, 80w. input, in-built relay for linear, only 15" x 10" x 6", complete with a.c. power supply and speaker in matching cabinet. Still under factory warrantry, £390. VK2DM, 40 Ware St., Fairfield, N.S.W.

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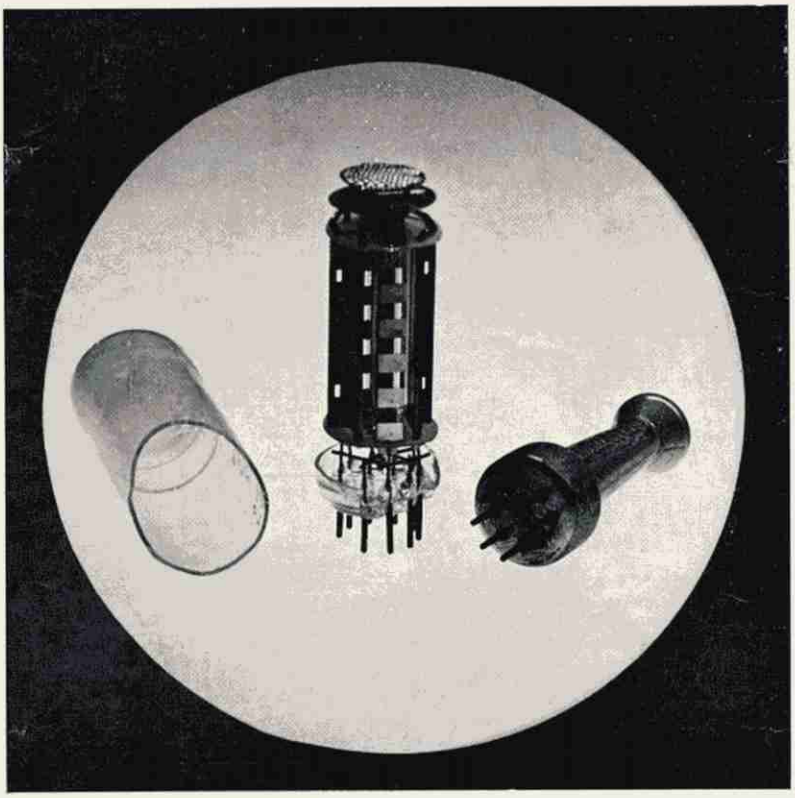
SELL: 3 element 14 Mc. Beam and 40 ft. Steel Tower, with prop-pitch motor, £75. Heathkit Balun, £6. M. Hilliard, 57 Gardenia St., Blackburn, Vic.

SELL: 5AX Pre-selector, £3. Collins 3.1 Kc. Mechanical Filter, £10. 50 Mc. Mobile Converter, £10. 10 element 144 Mc. Yagi, £5. M. Hilliard, 57 Gardenia St., Blackburn, Vic. Phone 89-2498.

AMATEUR RADIO

APRIL 1964



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THE EDITOR,
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P.O. BOX 36,
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Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

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Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

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OUR COVER

Readers should refer to page 9 where a more detailed explanation is given regarding the cover feature.

FEDERAL COMMENT

★

COLLECTIVE RESPONSIBILITY

The title of this Comment was inspired by one of the same name in the R.S.G.B. "Bulletin" which pointed out some of the dangers ahead for Amateur Radio if the Amateur does not present a united front at all future International Telecommunication Conferences. The Editorial made three points which briefly were: (i) Region II. and III. Societies must establish active regional organisations as in Region I.; (ii) the I.A.R.U. must bring home to administrations, particularly in newly developing countries, the importance of Amateur Radio as a Service and a scientific hobby, and (iii) the I.A.R.U. must be represented at every International Conference as well as Frequency Allocation Conferences.

The portent and sense of these points are to be commended and generally have always been supported by the W.I.A., but because of different conditions, both political and geographical, are not necessarily our answer to this challenge. The W.I.A. has made two approaches in the past to all Region III. Societies to form a Regional organisation but without success. New Zealand has also made at least one unsuccessful attempt along the same lines. Regarding the second point, the International Amateur Radio Union can undoubtedly contribute by way of suitable literature and a constructive public relations programme, and also in relation to the third point, must always be represented at International Conferences as the head of an established Service.

However, the W.I.A., despite its unsuccessful approaches in Region III., does believe that many benefits may accrue by regular exchanges of information between Region III. Societies in relation to regulatory matters and frequency problems. The answer may lie in the publication of a Region III. Newsletter between the appropriate Societies of which there are at present ten. Although it is conceded that the I.A.R.U. can do some good with newly developing countries, it is believed that perhaps more can be achieved by Amateurs in the particular country. Each administration must be made aware of its Amateurs and the role they can play in the community, and this can best be done within the countries' boundaries. In relation to I.A.R.U. representation at I.T.U. Conferences, although in favour of this idea, the Institute believes that a proper briefing on Amateur matters for the national delegation is more important and has achieved such status in the last few years.

Although the above arguments may appear to decry the points made in the R.S.G.B. Editorial, the intention is rather to point out alternatives which suit our Institute better and which we know are workable and successful in our case. However, the W.I.A. does believe that the status of the International Amateur Radio Union must be enhanced and supported in every way possible. Perhaps financial support of the Union is the next step in this direction. Any means of presenting the Amateur's case in his country or at International conferences must receive the wholehearted co-operation of Amateurs in general and National Amateur Societies in particular.

FEDERAL EXECUTIVE, W.I.A.

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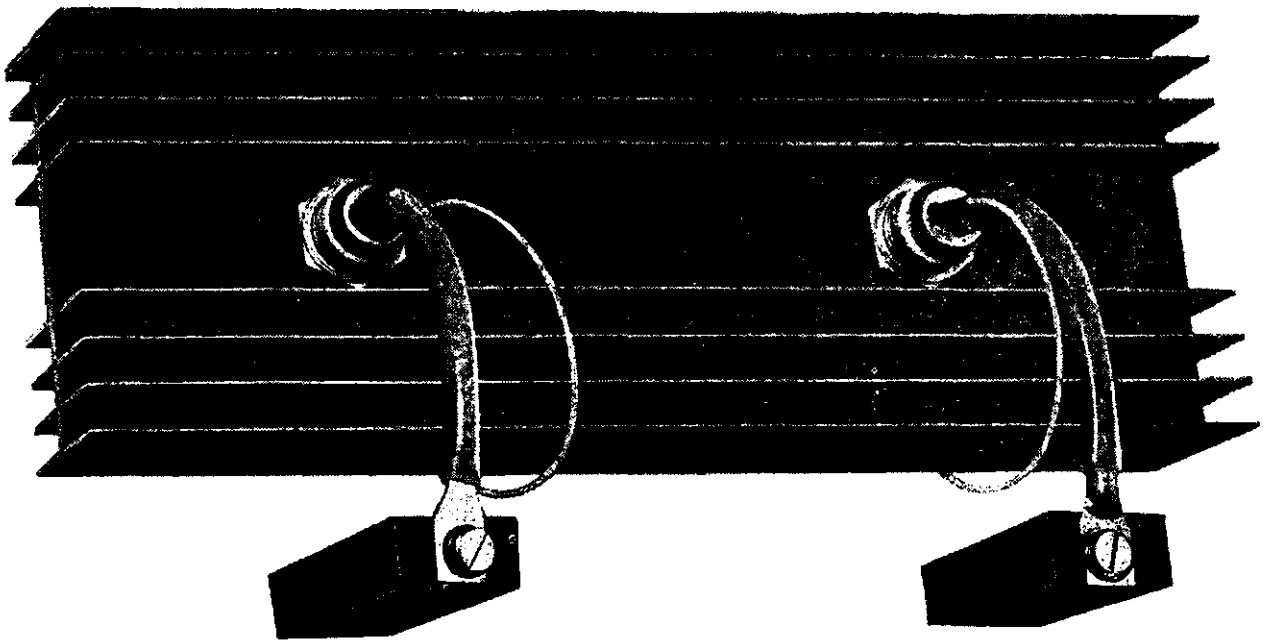

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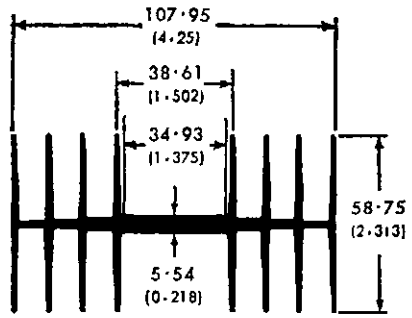

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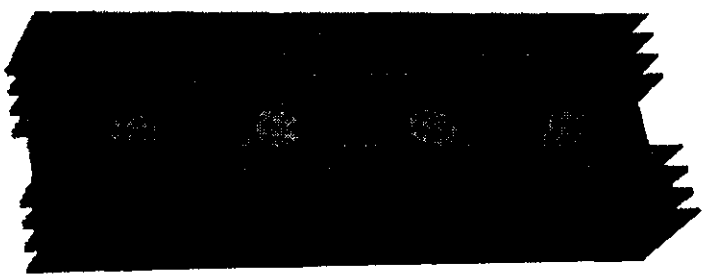
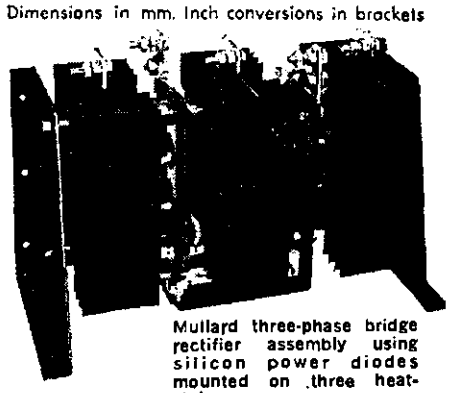


A push-pull parallel arrangement of four ADY26 transistors mounted onto a locally produced 400 heatsink extrusion.



Mullard three-phase bridge rectifier assembly using silicon power diodes mounted on three heatsinks.

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TALKING POINT—WNG.-CDR. C. G. HARVEY,* R.A.A.F., VS1AU (Ex VK2AQU, VK3UO)

WITH an astounding increase in amount of expensive commercial equipment now used in Amateur shacks, it may interest the S.w.l. and the newer operators to know the simple equipment which keeps VS1AU airborne on sideband.

Using a hodge-podge of components dating from 1930 to the present, acquired from Japan, U.S.A., Australia, U.K., Germany, China, Holland and Malaya, and paid for in as little of the national currencies as the market permitted, a reasonable signal has been kept on the air for years with the absolute minimum of expense.

With present-day pressure for modernisation and miniaturisation, it will come as a surprise to many, to hear that the rig still uses two electrolytics acquired in the early 1930s, and that the receiver uses four more, which are about twenty-three years old. There are also two power transformers and a type 80 of similar vintage, which were salvaged from discarded domestic t.r.f. radios of the same era. Some old fashioned glass and carbon resistors are still in use, and there are even one or two paper capacitors which still pass a leakage test, despite twenty-five years in Amateur service.

In the station equipment there are such treasures as a toilet roll coil former, panels and shields cut from aluminium acetate gramophone records, film cassettes used as coil shields, two oxo tins, a chassis made from a refrigerator ice block tray, another from a baking dish, a buffer coil wound on a pill box (which used to hold the dog's worming pills), some knitting needle shafts and stand-offs, nylon fishing line insulators, and even portion of an electric iron element.

One component is known to have been flown above 50,000 feet in a jet, and near the speed of sound, other disposals gear saw wartime service throughout the Pacific in flying boats and land planes, others, such as a dynamic speaker, came from discarded prewar receivers and even from motor cars.

Strangely enough, these old components give no trouble. Presumably, those that were going to fail in Amateur service did so long ago, leaving the remainder reliable for as long as their chemistry will permit. Some of the oldest tubes, particularly an 803, 866 and a 5Z3, are most reluctant to lose their emission despite operation over a period which must far exceed their intended life.

The acquisition of potentially useful bits and pieces, and the welding of them into a series of station projects, has been great fun. The biggest expense has been in time spent seeking inspiration. Whilst the station's appearance would not melt an XYL's heart, it has, with few exceptions, operated reliably and consistently. In fact, it has often received praise for its quality and performance, even with low power and simple antennae. In its sideband configuration, it has been on the air nearly every day for the last six years, and has survived almost three thousand QSOs (including potential D.X.C.C.), from Singapore, with its 90/90 temperature-humidity climate. Although it sounds like a relic of the breadboard era, it has been modernised to the extent that it now boasts a Kokusai mechanical filter and a nuvistor preamp. for the receiver.

However, it started life in the mid thirties as a c.w. station using plywood panels and chassis, with brass nails for tag strips, it lapsed briefly into a.m., graduated to the aluminium era and was subsequently modified for s.s.b., which it has been pounding out for about five years.

You won't find all the circuits in any book, but for the price of a good suit, spread over thirty years, it has provided countless hours of instruction, construction and enjoyment. Of course there have been periods of frustration and even despair, but these have generally been amenable to solution after an hour or so with the handbook, or a discussion with knowledgable and helpful Hams on the air.

One day, inevitably, there will be a sudden smell of burning and the gear will suffer a major failure which will finally be uneconomic to repair. Alternatively, the demands on Hamming time, or for house room, may be such that I will eventually have to "go commercial", or go QRT.

When that time comes, I will look back on many interesting and useful years of experimenting and the satisfaction of finding out for one's self a wide range of electronic, communication and constructional techniques.

If my experience is indicative, and I know many who agree it is, the lessons learnt and the attitude of mind engendered by success and failure in such projects stand the new Amateur in such good stead that it is to his lasting advantage technically, mentally and financially, to resist the temptation to indulge in commercial equipment at too early a stage in his Amateur career.

The new Amateur may be dismayed and misled by the reverence for formal mathematical design data shown by many text book authors. Whilst a theoretical approach has its points, the fundamentals set out simply in the A.R.R.L. and R.S.G.B. Handbooks, if understood, are more than sufficient to allow the beginner to experiment freely and successfully with many different combinations of components to those shown in published circuits.

It is seldom necessary to build equipment exactly as shown in the latest magazine or handbook, which, for commercial reasons, probably includes the latest tubes and components, which can't be obtained cheaply, if at all, in some locations or countries. It is as well to remember that whilst tube types change almost daily, basic principles do not, and a stage gain of 10, for example, can still be obtained as easily with an old 56 as with a new fangled 6CL6.

Intelligent observation is the first key to success. Although a shack full of the latest test equipment helps (if you know how to use and interpret the results), much interesting and successful work can be done with a multimeter, a capacitor leakage tester, a grid dip oscillator and a little patience.

When it is realised that transmitter output must be increased four times to double the field strength, the virtue of slightly increased home station efficiency is doubtful, particularly if only a marginal increase of a watt or two in 150 is provided by the latest superdooper miniaturised tetrode costing about four times as much as its slightly less efficient older brother. Any deficiency arising from the use of lower power can generally be made up quite readily by more attention to detail in the aerial system, where value for money comes better than in buying power transformers and p.a. tubes.

For those whose inclination is to experiment with junk box gear, I have a sincere plea. Don't take risks with old power transformers or power supplies. Check and double check for internal shorts and correct connections. Earth the laminations, and make sure the mains connections cannot stray in contact with other parts of the circuit. Do not use wiring methods which can leave h.t. or high voltage a.c. on, when there is no clear indication that the transformer or supply is alive. If you must fiddle while the high voltage is on, use one hand only, think what you are doing and don't work in bare feet. An occasional "belt" is inevitable, but try and make sure that it is low voltage only and is received as the result of taking a deliberate risk, rather than as the result of absolute mental or physical carelessness. A mild tickle does you the world of good, but a solid, unexpected belt can only benefit your next of kin. Whenever in doubt, "**Switch to Safety**" and think the problem over, before trying again. Finally, make sure that metal chassis are permanently earthed well enough to blow line fuses in the event of a mains-to-chassis fault, that microphones are earthed and that headphones are properly isolated from the h.t. line.

Make it a rule never, never, never to poke round inside a live chassis while wearing phones, or holding the microphone.

Faulty headphone insulation caused by perspiration, for example, can effectively earth your skull, so that the first inadvertent prod on the h.t. line with a finger puts you on the hot seat of a miniature Do-It-Yourself electric chair.

People who are superstitious about electric chairs, also make a point of using double pole switches and three-pin plugs on all mains leads, and bleeders on the filter capacitors. They also make sure that single pole switches are in the hot side of the mains. While you're about it, better make sure the rest of your family know how to kill all power in the shack if they notice an aroma of fried Ham!

Home made gear need not be dangerous. Safety and performance do not go hand in hand, and it is part of an interesting challenge to equate these conflicting requirements as economically as possible using available resources. Why not have a bash? ●

* C/o. Hqrs. Far East Air Force, R.A.F., Changi, Singapore 17.

HOW TO WIN A CONTEST

ADRIAN ROFE, VK2HE*

MY attitude towards contests, as set out in "Amateur Radio" (Mar. 1964, p. 17), met with disapproval from many who entertained different views. Why, they asked, adopt this defeatist outlook?

After a thorough review of the situation and some deep thought I have undergone a mental turnabout. The erstwhile mouse is now a fully grown lion. Believing that the spectator knows far more about the game than the players, I unashamedly take pleasure in advising the keen enthusiast how to win a contest.

First of all change your occupation and become an employee in an appropriate industry where you will be stood down for your three weeks' annual leave at Christmas time. Accumulated sick leave will add, say, another week. It is presumed that, after the manner of some of our valued domestic animals, you have spent the winter months increasing the thickness of your hide. If you are lucky enough to be the favourite nephew of a deceased aunt or have won a substantial prize in the lottery, you will have moved to a good location and acquired a 150 watt transmitter, a 300 watt modulator, the best receiver and a high gain antenna.

Rid yourself of all unco-operative members of your household by sending them for a month's holiday to Central Australia. Anyway, they will not have your participation in any Christmas festivities, so they might just as well be in the desert. However, one helper is desirable to provide you with numerous cups of tea, late meals and bowls of water and a sponge, which are the only ablutions permitted. Baths are out for the duration, so get yourself an effective fly spray to ward off the increasing incursions into the shack of those noxious pests. If you like well-matured gorgonzola cheese, you will like yourself all the more by the end of the contest.

Widely advertise the fact that you are entering the contest, not for yourself, but for the Division. You might add that if any certificates or trophies you may have won are subsequently retained in your shack that will have been an oversight. Work on all your radio friends—while they are still your friends—to get them to promise to forego Christmas holidays and remain in the shack to give you numbers. If any of them seriously threaten to compete with you, request that they listen to your test transmission. Your over-modulated signal should cover a large portion of the band and your voice resemble the sound of a buzz-saw—deneutralise your final if necessary to achieve this effect. This is guaranteed to bring about their early withdrawal from the contest. T.v.i. proof all receivers within a radius of five miles from your QTH.

* 18 Fairlawn Avenue, Turramurra, N.S.W.

Now the contest has commenced, consider all contacts in relation to their numerical value to you, but do be polite to all operators. Give everyone a 5 and 9 signal report, even if you have to ask him to repeat his number several times. Flatter his modulation. He likes it and will call you day after day to hear your repeated words of praise. Waste no time looking up the fellow's name, he is either John, Bob, Peter, Ken, Keith, Geoff, Colin or Ted, so have a stab at it and you will probably be correct. Promise to send an immediate QSL card—he will call you day after day to ask why it has not arrived thereby increasing your numerical tally.

For 1 pointers—be fairly nice but brief. If the fellow wants to describe his gear, so long as you have his number, let him ramble on while you work other stations.

For 5 pointers—be nicer and less brief and find time to comment on something irrelevant, such as the weather or their gear.

For 10 pointers—be positively effusive. These are definitely to get the V.I.P. treatment. Send them the gift of a piece of gear such as an old converter to improve their reception of your signal. Invite them to bring their families to stay at your home. Having v.f.o'ed. onto their frequency, either hold the contact for an unreasonable length of time or conclude it and continue to call CQ on the frequency. If you do the job well these fellows will turn a deaf ear to all other callers.

While awaiting a band opening, start a group discussion among the locals—the bigger the group the better. Quickly sneak away when the band opens and you will have several numbers in the bag before the others wake up to it.

A tough local competitor can always be called on the telephone when you will ask him to wait while you see who is at the front door. After about 10 minutes he will return to the shack to find you working the DX.

Try tuning the band from the high to the low frequency end—it has never been done before. Do not be surprised to find a station there quite high in frequency isolated like a shag on a rock waiting to pounce on any caller. He is well outside the tuning range of the modern receiver and, unknown to all but you, has been there since the beginning of the contest. The fellow has called CQ thousands of times and has heard the DX come and go. When all other stations have been worked, his closest approach to a contact is "Sorry, old man, I just cannot copy you." The fellow will be most grateful for the contact and you have made a friend for life.

Thankful for a few crumbs like a starving animal he will lick your hands and your feet. And your arsenal of alibis is of no avail to excuse you from listening to his life's story. His gear is set out on several bread boards, his antenna constructed of fencing wire and his shack is shared with Daisy the cow. Yes, he has only been able to work JAs and the odd VK8, but these chaps are always in such a hurry to get away. You listen to a detailed description of his paspalum paddocks—such good fodder—and the sow's latest litter and his aunt's last illness. You pray that his signal will fade out—it never does. You try to start some topic of conversation but, however hard you wreck your brains, you can think of nothing to say because as the potential winner of the contest you are completely out of touch with world affairs, having not read a newspaper nor listened to a broadcast nor spoken to a normal person for days. Wars have been waged, lost and won without the conscientious competitor being aware of the fact. You just have to listen to his tale and take it. Your impending dissolution is saved by his call to dinner and he leaves you with your promise to look for him at the same time tomorrow.

The contest is now over and the next job is to complete the log and add up your score for submission to the contest committee. This must be done honestly and accurately. The fellow you claim to have worked every day may turn snakey and send in a log. Do not claim an unreasonable variety of VK8 contacts—the committee has the latest edition of the Call Book. If you believe that under certain circumstances 2 and 2 can be made to equal 5, remember that the committee possess an adding machine.

Now, fellow amateur operator, that you have won the coveted trophy, the problem arises as to how best it can be displayed. I have seen these things covered with dust and lying in a neglected corner of the shack, so put it in your most prominent place for all to see.

A concluding note from that wise originator of smoke signals, Smokey Joe, "Let any evil that might be construed therefrom be already in the mind of the reader". ●

A Junk-Box Frequency Standard*

INEXPENSIVE OSCILLATOR-MULTIVIBRATOR UNIT

ROY R. CAMPBELL, D.D.S., W4DFR

MOST Amateurs these days provide themselves with a 100 kc. crystal "calibrator"—either built into the receiver, or external—which furnishes harmonic signals accurately marking the low frequency limits of the various Amateur bands. However, since the harmonic frequencies fall at intervals of 100 kc., it does not provide similar calibrating signals for the upper or lower limits of some of the phone sub-bands. In addition, there are many other occasions calling for markers between 100 kc. points. Such markers are useful in the calibration of a v.f.o., in spot-frequency schedule operation, or in accurately calibrating a receiver dial.

For the most part, such a piece of gear has been a fairly costly item; even those that have been available on the surplus market have been by no means inexpensive. In the unit described here, I have attempted to hold the cost down to suit the average pocketbook while still maintaining an accuracy, if proper precautions are used, closely approaching that of more expensive equipment. Most of the components for the original model were picked out of the junk box; with all new parts, the cost should not exceed $15.00. Other than the crystal (which is not a strict requirement), no part is classified as "precision," although certain of the components add value if care is used in their selection. Power for the unit may be taken from most receivers, but a self-contained source can be very modest. Simple VR tube regulation is desirable where line-voltage fluctuation may be a problem.

• This unit provides spotting frequencies at 10 kc. intervals. With a little care, accuracy approaching that of much more expensive equipment can be realised. If you already have a 100 kc. crystal calibrator, the cost can be reduced still further.

OSCILLATOR

The circuit of Fig. 1 starts out with the 6BH6 oscillator. The Colpitts arrangement was chosen because it lends itself well to either crystal or self control. Crystal operation will provide a more stable signal, of course, but the stability with self control is surprisingly good and will serve for most calibrating purposes. When using a tuned circuit for self-excited operation, no coil tap is required. This is an advantage, especially when a multilayer coil is involved. The circuit will work over a wide range of frequencies, which makes it additionally useful for checking crystals, or for using higher frequency crystals for spotting certain frequencies. The output is rich in harmonics.

THE MULTIVIBRATOR

The second stage in Fig. 1 is primarily a multivibrator using a 12AU7 dual triode. As most readers know, a multivibrator is a resistance-capacitance oscillator that is quite unstable by itself, but which can be stabilised by driving, or triggering it with a stable oscillator of higher frequency. Thus, it becomes a "frequency divider". In this instance, the multivibrator frequency is 10 kc. which provides harmonic spotting frequencies of usable strength at 10 kc. intervals up to at least 30 Mc.

Although a multivibrator will "lock in" with a driver frequency as high as 100 times the multivibrator frequency, adjustment becomes quite difficult if the driver frequency is more than 10 or 20 times the desired multivibrator frequency. The multivibrator, being an unstable oscillator, has an increasing tendency to jump from one sub-multiple of the driving frequency to the next as the driving frequency is raised. That is, if the driving frequency is 1,000 kc., the multivibrator frequency may jump from the desired frequency of 1,000/100 = 10 kc. to 1,000/99 = 10.1 kc., or to 1,000/101 = 9.9 kc. For this reason, the oscillator is designed to operate at 200 kc. self-excited, or 100 kc. crystal-controlled when driving the multivibrator.

The multivibrator may be switched off by means of S1; S1B opens the cathode of V1A in all except the m.v. position. The oscillator signal is then simply coupled to the grid of V1B which operates as a resistance-coupled amplifier. Since this switching results in a small change in oscillator frequency, C5 is provided in the oscillator circuit to compensate. This capacitor is adjusted so that the oscillator frequency remains the same with the multivibrator in or out of the circuit.

OUTPUT AMPLIFIER

The 6AK5 amplifier is included principally to isolate the multivibrator from output loading effects. It will, however, provide some amplification of oscillator harmonics when the multivibrator is switched out. A parallel-tuned tank connected across the output terminals of the amplifier may be used to accentuate certain harmonics if desired, although the simple resistance coupling shown provides good signal strength up to at least 30 Mc.

CONSTRUCTION

Components may be assembled on any chassis of convenient size. There is nothing particularly critical about the arrangement of parts on the chassis. If the crystal is not used, the capacitance of C1 should be about 1.5 times that of C2. The exact values will depend upon the inductance of L1. I used an r.f. choke from an old diathermy oscillator. The inductance of this choke is about 1.6 mH., and it tunes to 200 kc. with a capacitance of 780 pF. at C1 and 530 pF. at C2. The odd values were made up of standard values in parallel combination. These capacitors should be mica, preferably silver mica, and the coil should have a reasonably high Q.

Critical adjustment of capacitances can be avoided by using a slug-tuned coil, such as the Miller type 4414 which has an inductance range of 1.3 to 2.1 mH. This coil should be capable of tuning to 200 kc. with standard values

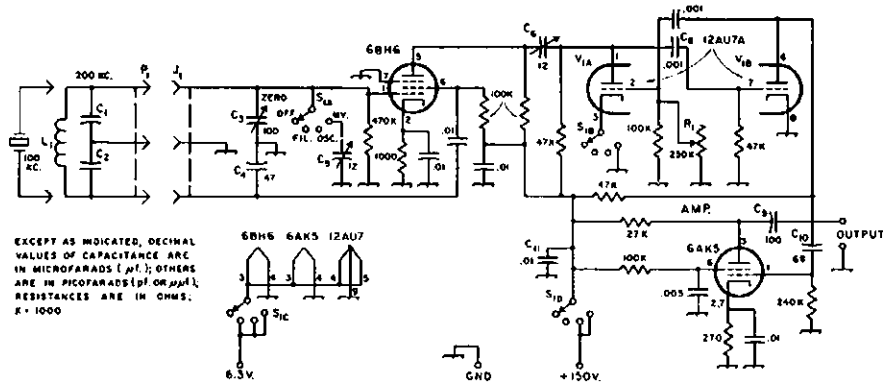


Fig. 1.—Circuit of the Frequency Standard. Resistors are ½ watt. Fixed capacitors not listed below are disk ceramic.

C1, C2—See text.
C3—100 pF. midget variable.
C4, C7, C8, C9, C10—Mica, preferably silver mica.
C5, C6—NPO ceramic trimmer.
C11—Paper.
J1—Five-prong ceramic tube socket.
L1—See text.
P1—Five-prong plug.
R1—Linear control.
S1—Ceramic rotary switch: 2 sections, 2 poles per section, 4 positions.

* Reprinted from "QST," January 1964.

of 7,500 pF. at C1 and 5,100 pF. at C2. The five-prong socket J1 will accept most crystals as well as a five-prong plug-in coil form.

ADJUSTMENT

The oscillator should be adjusted first. The output terminal should be connected to the antenna terminal of a receiver. The circuit should function with most crystals, regardless of frequency. With higher frequency crystals feedback may be adjusted by means of C3. When a 100 kc. crystal is used, C3 is used to "zero" the crystal against WWV.

To adjust a 100 kc. crystal, turn on the receiver b.f.o. and listen to one of the harmonics. The beat note should vary as C3 is adjusted. Now turn off the b.f.o. and tune in WWV. A beat should be heard between the 100 kc. oscillator and WWV's carrier. Adjust the beat to zero by adjustment of C3. Broadcast-band signals at exact multiples of 100 kc. also provide good reference signals. Although there is a small tolerance allowed, most broadcast stations hold within a few cycles of their assigned frequencies.

If the receiver is equipped with an S meter, this may be used as an accurate indicator of the beat between the 100 kc. oscillator and the standard. As the beat approaches zero, the reading on the S meter will fluctuate, more rapidly at first, and then more slowly, until at exact zero beat the needle will remain motionless. If C3 is adjusted further in the same direction, the fluctuations will resume. C3 should then be returned to the point where the needle is stationary.

The adjustment with the tuned circuit instead of the crystal is similar except, of course, for the preliminary adjustment to approximately 200 kc. as described earlier. If the broadcast band is used as a reference, only those signals at exact multiples of 200 kc. will be useful. C3 may be used as a final trimmer.

With the receiver b.f.o. turned on, you should now hear harmonic signals every 100 kc. (or every 200 kc. with self excitation) throughout the tuning range of the receiver, up to at least 30 Mc.

ADJUSTING THE MULTIVIBRATOR

Before attempting to adjust the multivibrator itself, zero-beat one of the 100 kc. (or 200 kc. with self excitation) harmonics on a receiver. When S1 is turned to the m.v. position, the oscillator frequency may change slightly. Without touching the receiver tuning, adjust C5 to bring the signal back to zero beat.

In adjusting the multivibrator, the broadcast band is a convenience. Since the American broadcast channels (and Australian.—Ed.) are assigned at exact multiples of 10 kc., the multivibrator signals should fall at zero beat on all broadcast carriers when the multivibrator is correctly adjusted. If the adjustment is not correct, a beat note will be heard on each broadcast carrier (with the receiver b.f.o. turned off). In such a case, pick out a broadcast carrier in a clear channel and listen to the beat note as R1 is slowly adjusted. As R1 is adjusted the beat note should suddenly hop to a different frequency. At some point within the range of R1, the beat note should drop to zero. When this occurs, check one or two other channels to make sure that the multivibrator signal is at zero beat with these carriers also.

The multivibrator is rather touchy as to the strength of the driving signal. If the driving signal is too weak, the multivibrator will have a tendency to jump from one submultiple to another. If the driving signal is too strong, "squegging" may take place which will be evidenced by a myriad of unidentifiable beats as the receiver is tuned. Overdriving may also cause the multivibrator to produce signals at 20 kc. intervals, rather than 10 kc. intervals. In any case, it should be possible to make corrections by adjustment of C6. Under proper operating conditions, an oscilloscope or peak-reading v.t.v.m. should show a 10 to 20 per cent. higher voltage at pin 7 of the 12AU7 than at pin 2. C6 may have to be adjusted differently for the crystal than for the tuned circuit.

While the crystal harmonics will be reliable shortly after the power supply is first turned on, it is advisable to allow plenty of warm-up time for the multivibrator and the self-excited oscillator, if the latter is used. The amount of power consumed by the unit is negligible, and the Amateur who finds use for it two or three times a week will soon learn the value of leaving the heater power on all the time, even when not in use.

ACCURACY

The principal difference between this unit and one costing many times as much is in the long-term stability. Changes in humidity as well as temperature will affect the accuracy. It is the compensation for such effects that runs up the price of more expensive equipment. However, the short-term stability is excellent and, in the hands of a careful operator, highly accurate measurements can be made. The only requirement is that the oscillator frequency be checked against WWV immediately before the measurement is made and again immediately after. The latter check is perhaps the more important, especially if the measurement has taken more than a moment or two, for it tells whether the oscillator frequency has changed during the measurement. If there has been a change, the amount can be estimated to determine if the accuracy is sufficient for the particular purpose. If not, the measurement can be repeated. ●

Technical Correspondence

RECEIVER FRONT-END DESIGN

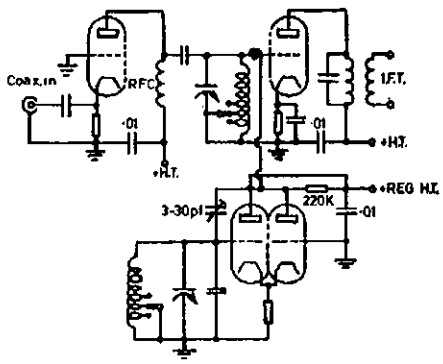
Editor "A.R.," Dear Sir,

The article on receiver front-end design by W0DAN in January 1964 "A.R." leads to consideration of ways to achieve equivalent performance in practical circuits.

The desired r.f. amplifier characteristics may also be obtained by use of a grounded grid stage, with considerable simplification of circuitry. A circuit following this line of thought is given in the new R.S.G.B. Handbook. Here two halves of a twin-triode are used, the first being a grounded grid amplifier, the second a triode mixer, with two tuned circuits coupling them.

For all those except the unfortunate few living adjacent to powerful high frequency transmitters, even greater simplification may be achieved by using a single tuned circuit between the two stages. With this configuration problems of gang tuning and alignment disappear, while band changing can be effected by tapping up the coil from the earth end, thus eliminating problems of switch capacitance and lead inductance.

Provided sensible L/C ratios are used, together with high Q components, e.g. air spaced coils of generous diameter and spacing, the rejection of unwanted signals should still compare more than favourably with the conventional receiver front-end using two tuned circuits and a pentode r.f. amplifier. In the circuit shown, the tuned circuit is not loaded by the antenna, and tube loading is less than with the grounded cathode stage.



I have included the circuit of an oscillator circuit popular in ZL. It has many advantages, including low harmonic output and ability to oscillate with almost constant output over a wide range of frequencies. The feedback capacitor is adjusted to the minimum value required for reliable oscillation at the highest frequency required. Output may also be taken from the cathode if required.

It must be kept in mind that the performance of such a front-end will be degraded if it is followed by a mixer stage having poor signal handling capabilities, or a poor signal-to-noise ratio. For best results of all it should be followed by a high or low frequency bandpass filter, the aim being to get the most selective element in the receiver as close to the antenna as possible.

—Barry Kirkwood, VK2AUV,
ex ZL1DR, ex ZL3IJ.

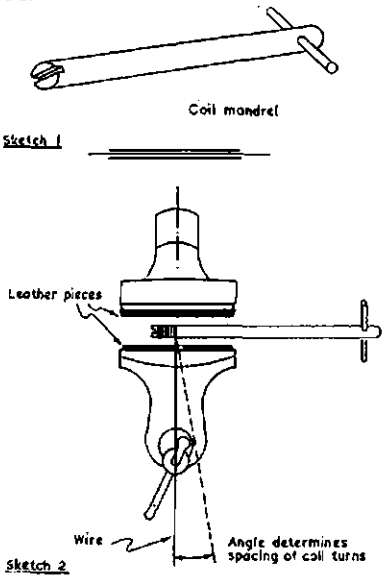
Method of Winding Coils*

TO GIVE EVEN SPACING TO ANY DIAMETER

W. C. GREEN, G3QG

Visiting a model engineer friend recently the writer was interested to note the way in which he made the small springs for his models. It was realised that the method he used would be suitable for making radio coils, and after reading hundreds of books and magazines, and not having seen it described before, the idea is hereby passed on. The tools and material used are simple and easy to make and obtain. No great skill is needed to make coils even up to 1 inch diameter and no one need fear the result.

The first thing to make is the winding mandrel (see Sketch 1). This can be of anything round—such as wood dowel, paxolin tube, or metal rod, the latter for preference. A slot is cut in one end of the rod, deep and wide enough to take the gauge of wire that is to be used. At the other end of the rod a means of rotating it is needed. Next, provide some padding material, such as scraps of leather. This, with a bench vice and the necessary wire, is all that is needed for the production of perfect coils.



Sketches to illustrate the idea explained in the text. It certainly works very well, as seen from some samples sent in by G3QG with his article.

MAKING THE COIL

Place the padding between the jaws of the vice and grip the mandrel between them; tighten it up so that it is just possible to turn the mandrel. The slotted end of the mandrel should be about half way along the vice jaws (see Sketch 2).

The wire is then fitted in the slot in the mandrel, which is turned with one hand as the wire is fed in with the other. Holding the wire at right angles to the jaws of the vice will give a close-wound coil which can be wound as long as required.

If the wire is fed in at an angle to the vice, a spaced-turn coil will be the result. As the wire is wound on the mandrel, it will look to be close-wound, but on releasing the coil the springing-out effect will give the spacing. It is possible to wind a coil beginning it as close-wound and then to change the spacing several times over its length merely by altering the angle of feeding in the wire. There is no need to straighten the wire—just feed it in from the reel. The writer's first coil made in this way was of ¼ inch diameter wound with 18 gauge tinned copper wire, and was perfect.

As in making coils by any other method, the diameter of the mandrel will govern the final diameter of coil required because the coil will expand on being released. For example, to wind a ⅜ inch diameter coil the diameter of the mandrel will have to be less.

The method of making coils as described here is so simple that it leaves you wondering why you never thought of it yourself—there need from now on be no more tying the wire to a door handle and walking towards it, only to find when the coil is half-made someone wants to open the door. ●

* Reprinted from "Short Wave Magazine," January 1964.

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Book Review

AUDIO AND ACOUSTICS

By G. A. Briggs

This slim volume of 163 pages was written as a replacement for "Sound Reproduction" which ran out of print in 1962. It appears to the reviewer to be an ideal "short text" for those who need a quick appraisal and a broad understanding of this field. This book covers a great deal of ground in a few brief pages written by perhaps the most prolific writer of books on loudspeakers and allied subjects.

Price 17/9 plus 1/- postage. Our copy from McGill's Authorised Newsagency, 183-185 Elizabeth Street, Melbourne.

INDEX TO SURPLUS

By Roy E. Pafenberg, W4WKM

This is an index to over six hundred magazine articles published in "QST," "CQ," "73 Magazine," "Electronics World" and "Radio Electronics." It gives the title of each article and a brief description of the subject matter. At a price of approx. 18/- per copy, it is unlikely to appeal to a great number of Hams. However, several copies of this index should be held by any library which has the magazines listed as it is a very quick method of finding much sought after information.

Published by Amateur Radio Publishing Inc. Our copy from Victorian Division, W.I.A., who obtained the book from America.

OUR COVER . . .

HINTS AND KINKS

SOLDERING MINIATURE VALVE SOCKETS

Many Amateurs using miniature glass button base valves adopt incorrect wiring practice when soldering components onto the valve socket base lugs. The cover photograph shows the disastrous results that can occur, with the valve being ruined due to glass fracture.

When wiring a miniature valve socket it is very important that the lugs be correctly positioned. This can only be done by using a wiring jig, available for a few shillings each. An old valve is not a satisfactory substitute.

The wiring jig, seven or nine-pin, is a very robust device which is inserted into the valve socket whilst the parts are soldered onto the socket lug. The jig keeps the small valve socket lugs correctly spaced so that the valve will accurately fit into the socket.

The cover photograph shows the actual effect of incorrectly positioned miniature valve socket lugs. When the valve was inserted excess strain was put on the glass button base, the valve then warmed up during operation. This created additional stress and the base fractured.

A complaint was made to the makers who examined both the valve and socket. They pointed out that the particular socket used did not comply with the required standard, and in addition the lugs were incorrectly spaced. They rejected the claim for replacement under warranty which, under the circumstances, was only fair.

Since that time the correct metal wiring jigs have been used during construction and no further trouble has been met. The low cost of the wiring jigs is far lower than the cost of replacing a broken valve.

The jig should always be removed from the valve socket before testing the circuit. The heavy metal construction acts as a very effective direct short to all pins and does make the filament transformer groan under the load!

Modern ptfe or porcelain sockets are a preferred type as one low cost "bakelite" type of wafer socket imposes excess strain on the valve base, because of incorrect socket design.

Be warned and invest a few shillings in a wiring jig to save having to replace broken valves. Don't think it can't happen to you. The cover photograph shows that breakage does occur and your valve may be next!

REMOVING BROKEN DRILLS

When a metal drill breaks off below the surface of the material being drilled, drive two thin wire nails down the flutes of the drill; with a pair of pliers twist the nails in an anti-clockwise direction to remove the drill from the work.—N.Z.A.R.T. "Break-In."

VOICE OF AMERICA TRANSMISSIONS

The many Amateurs in this country who listen to the V.O.A. "Radio Amateurs Notebook" programme each Sunday, will no doubt be interested in learning the following vital statistical figures relating to the V.O.A. transmitting station at Greenville, N.C., U.S.A.

Total acreage: 6,194.24.
Transmitters: Six 500 kw., six 250 kw., six 50kw.
Transmitting power: 4,800,000 watts.
Total antennae: 94 (directional transmitting antennae, 73).
Antenna towers: About 400.
Height of towers: Up to 400 feet.
Antenna types: Rhombic, curtain and log periodic.
Total cost: About 24 million dollars.
Beginning of construction: Feb. 15, 1960.
Opening date: Feb. 8, 1963.
Steel for towers: 3,000 tons.
Concrete required: 36,000 cubic yards.
On-site paved roads: 30 miles.
Transmission lines: About 200 miles.
Electrical power requirement: 5,000,000 kilowatt hours monthly (based on daily 16-hour operation).
Micro-wave relay system: Six stations covering 265 miles from Washington studios to Greenville receiver station.

Voice of America programmes are on the air 24 hours per day in thirty-six languages—as part of the world's largest and most powerful long-range radio facility.

—BERS195, WIA-L3042.

OSCAR III.

I am pleased to let you all know that Oscar III. has been going well, and most all the defects are now out. Many tests have been completed and now it is expected that Oscar III. will be up about July or August, 1964.

As a number of you already know, Oscar III. is a communications satellite. It is expected that it will be a long way out in space, up to 1,000 miles. This will make the period longer, but you will have a much longer time in which to contact it, approximately up to 20 minutes, and possibly longer.

You will transmit to it on a frequency of 144.1 Mc., ±15 kc. That gives you a 50 kc. band-width. You will listen for your replies on a frequency of 145.9 Mc. ±15 kc.

An **urgent** request that the frequencies of 145.9 Mc. ±15 kc. be kept clear just before and during this new sphere of operations on the 144 Mc. band, namely Project Oscar III. Let's make a gentleman's agreement for the duration of these operations. Help your fellow Ham who wants to indulge in this new era of long distance communications. We can all help by requesting the possible offenders to move to another frequency, and possibly help him to go up or down in frequency. You may have a crystal you can loan, etc.

You call CQ Oscar III., announcing your call clearly and distintly. One minute seems to be long enough, then switch over to receive signals answering you. Do not stay too long as there are others wanting to get a contact. If you are alone you may make four contacts in the one fly past. I suggest that you practice a bit and get into the swing of short contacts. Of course if you are the only one about, say, during the day time, you may be able to hold a contact for 10 minutes or so.

The mock-up model of Oscar I. has been around the States. In N.S.W. it has been as far as Lismore, Gosford for the Field Day, to meetings, in shop windows, on t.v., and in the newspapers. It has to date been quite a success. VK4 have it for their Convention on 4th and 5th April. Owing to the relatively short time we can have the model, it will not reach all the States. This is, however, unavoidable. It has to be back in Sydney at the U.S.I.C. by 21st April. It is hoped that it will have visited at least five States.

—VK2HO, Aust. Co-ordinator.

☆

IT HAS BEEN SAID . . .

"A Radio Engineer is a person who passes as an exacting expert on the basis of being able to turn out with prolific fortitude infinite series of incomprehensible formulae calculated with micrometric precision from vague assumptions based on debatable figures taken from inconclusive experiments carried out with instruments of problematical accuracy by persons of dubious reliability and questionable mentality for the avowed purpose of annoying and confounding a hopelessly chimerical group of esoteric fanatics referred to all too frequently as practical radio men . . ."

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub-Editor: A. H. BEHENNA, VK5BB,
36 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Over long listening periods the DX appears to be at an all-time low, at least at this QTH. It seems the only good contacts being enjoyed are those running the maximum power and those with big antenna arrays. Conditions are very spasmodic, and no longer can you go to the shack at random and work that far off country. 14 Mc. however seems to be the old stand-by band. This band is opening occasionally to Europe, Mediteranian, etc., whilst the islands to the north are workable on most evenings at varying signal strength.

The skip right now seems to be very selective. Quite a workable signal say to VK3, but in VK5 only just audible. I suppose the reverse is happening on occasions. However, I think activity from down under could be improved by a lot more activity from the VK boys.

An instance was brought home to my notice on a recent evening. A certain ZL was relating to a friend how he tuned an apparently dead 14 Mc. band, to try it out he called CQ and from this one call he was rewarded with no less than three new countries.

We must realise that we are a long way from the major continents, which are the heaviest populated Ham areas and, incidentally, have to contend with a QRM situation we cannot possibly imagine. Then let's go to it. A CQ occasionally to let them know we are out and about—if they can't hear us, they can't work us.

NEWS AND NOTES

ST2AS is the present call of G3KPQ (ex VS1FO), now active from the Sudan Republic. The rig is a home-built s.s.b. rx using a McCoy filter, and the aerial a ground plane G2ATD, which is mounted on the roof and works extremely well. He is at present active on 14 Mc., but hopes to be on 3.5 Mc. very soon. QSLs should go via R.S.G.B.

The QSL Bureau for Sierra Leone has been taken over by 9L1HN, P. N. Heywood, The Technical Institute, Freetown.

QSL Bureau for the Aruba Amateur Radio Club has now been taken over by PJ3AO. Cards, etc., to P.O. Box 275, San Nicolas, Aruba, Netherlands Antilles.

Syria, never easy to work, has been represented on 14 Mc. a.m. by YK1AA, giving the name of Raschild and reported as active around 1500 on the high end of the band.

VS4RS has two xtal controlled frequencies to his original spot of 14301 kc. The others are 14120 and 14206 kc. QSLs come swiftly from this station.

ZS2MI, on Marion Island, has been intermittently active around 1800 on 14 Mc. c.w. and asking for QSL via ZS1OU. Usually openings are of short duration with signals not of very good strength. (4SS).

From the end of March FB8WW should be active from Crozet Islands. Marcel, the operator, is with a party of men now erecting shelters on the island. He is sometimes heard on 14050 kc. c.w.

From April 15-29, VK2AGH should be active from Lord Howe Island on c.w. and s.s.b. Bands will be 80, 40 and 20. Please call him 5 kc. up or down from the following: 3505, 7005, 7025, 14025 c.w. On s.s.b. 3695, 7095, 14120 and 14300 kc.

French *Oceania*, FO8, and New Caledonia, FK8, operated by Chuck WA2WBH on c.w. and s.s.b Frequencies: 3505, 7005, 14005 c.w.; 14105 kc. for s.s.b. 21 Mc. will also be tried out, conditions permitting.

The s.s.b. exciter now used by FR7ZD is to be shipped to FB8ZZ, Amsterdam Island, then later it will go to FB8XX, Kerguelen Island, thence to FB8WW, Crozet Island.

Active at the moment CR8AD from Portuguese Timor on c.w. at or about 14050 kc.

9K2AN is active on 14 Mc. c.w.

CE0ZI is legal and maritime mobile. This is the Chilean "Transporte Presidente Pinto" en route to Easter Island.

VP2KJ (W4SSU) reports that all QSLs have been answered that had s.a.s.e. to Dec. 27. No QSLs for those that did not abide by the aforementioned. Ken now has HT32 and Drake 2B and is active on 40, 20, 15 mx on s.s.b. and c.w. He is slow on c.w. so take it easy fellows.

Upper Volta, XT2, TU2AU and TU2AQ, have tentative plans to operate from XT2 during the second week-end of the A.R.R.L. phone contest. After this they hope to go to 5U7, then after returning to TU2 a later trip is planned to TZ, 7G1, TY and SV. TU2AQs go via W4HJK.

St. Helena, ZD7BW is back in England. While at ZD7 he made 7,100 QSOs with 104 countries. Mailing of QSLs is beginning.

Chagos, Rodriguez, St. Brandon and Agalega: From March 10 Harvey VQ9HB will be active on Chagosas VQ8BFC, then from other islands in the order given. Calls will be VQ8BFR, VQ8BFB, VQ8BFA respectively. Operation will be s.s.b. and c.w. on 14 Mc.

VP8GQ is still reported QRV.

Sudan: ST1WP has been reported on 14 Mc. s.s.b.

ZL3VB may be on s.s.b. from Chatham Islands in the near future.

Comoro Islands: FH8CD should be QRV any time.

Yemen: HB9AET/W4 was worked on 14 Mc. s.s.b. and HB9YG/W4 was worked on 40 mx c.w.

Marion Island: ZS2MI will soon be QRT. If you need him act quickly. Listen around 14159 kc. around 1300 G.M.T.

4U1ITU Geneva: This station now counts as a new country for D.X.C.C.

Jan Mayen: The following calls are now reported active from this rare QTH: LA9FG/P, LA9RG/P, LA9MI/P all on c.w., and LA9PI/P on s.s.b.

Antarctica: Dave Tremaine ZL1AV is flying down to take over the New Zealand Base Station ZL5AA. The South African Base will be activated by ZS4DJO on 14 Mc. s.s.b.

It is reported that Steve Perry, W1BB, has worked 76 countries on 180 mx. Anyone worked him from VK?

From 7200 kc. upwards some very good signals have been heard, mostly on s.s.b. around 0800. These include: KH6IF, WA6BXU, K6MCT, and KJ6BZ.

Cape Verdes Islands: CR4AD is now on and should be active for some time; been reported around 14125 kc. on s.s.b.

XW8AG active and also HS1AA on 7 and 14 Mc. c.w.

ACTIVITIES

Ken VK3TL reports having worked on 14 Mc. s.s.b.: CX1NE, VQ1GDW, WA1ANO/3A2, ZS6CY, K4JLD/6O1. On c.w. 14 Mc.: AP5GB, CP2EQ, EL7A, HS1S, HZ1AT, UI8AG, 4U1SU, 5Z4RF, 6O1WF, 9K2AN, 9Q5AB, CP5EZ, DU-4PAR, FO8AA, KG4BX, LU5, PY2, VP8GQ, VP8HJ, VQ2JG, ZS4, 5R8AJ. Best QSLs received: AC3PT, CR7FN, EI5AJ, EI8P, FO8AA, FR7ZF, JT1AG, JT1KAA, MP4BEE, PZ1AX, UI8LB, VP7NS, YA1A, YO9IA, 5Z4RF, CO8CO, FB8ZZ, JT1CA, SV0WT, VP2KJ, VQ4RF, YN-9BJM, 4X4BH, 4X4HI, FK8BB, XE1YI, KR6BF, and LU4UH.

WIA-L4020 heard the following on 21 Mc., but the mode not stated: VS1LV, VS1LX, VS-7DO, VR4EG, G5DJ, JA0EK, G3BUU, HC5MQ, WA5CZR, KA6DBJ, WA4JJ, W4HNA, W6JRY, W6HLH, W6LCX, 4X4LE, IT1GAI, 4X4BH, 4X4HI, FK8BB, XE1YI, KR6BF, LU4UH.

QTH CORNER

VS9MB—Am. Radio Club, R.A.F., G.A.N., B.F.P.O. 180, C/o. G.P.O., London.
ZD8HB—Via W2CTN.
6W8AC—Jean Claude Wagner, P.O. Box 971, Dakar, Senegal.
ZS8Z, ZS9Z—Via ZS6BBB, B. P. Avdon, Box 6216, Johannesburg.
5B4WS—Via K1LBH.
FS7MB—C/o. W3ZQ.
ZS2MI—Via ZS1OU.
MP4TBA—Box 300, Abu Dhaba.
VK4JQ—Via W6HYG, 1011 Tam O'Shanter Drive, Bakersfield, California.
VP2KJ—Via W4SSU.
VP8HK—C/o. R.S.G.B.
HC8FN—C/o. WA2MUV, Box 296, Massapequa, Long Island, New York.
9X5MH—C/o. DL1LC, Box 344, Cologne, Germany.
9A1VU—Via D.A.R.C., P.O. Box 99, Munich, Germany.
MP4DAH and MP4QBG—Bing Crosbie, C/o. Schlumberger SA, ADMA, Das Island, via Bahrein, Arabian Gulf.
UR2BU—K. Kallemaa, Vaike, Tahe 14-1, Tartu, Estonia.
TC3ZA—Via G8KS, S. L. Hill, Rivenhall, Holwood Park, Farborough, Orpington, Kent.
9N1MM—Op. W4BPD, Via W4ECI, 3101 Fourth Ave., Birmingham, S, Alabama, U.S.A.
5N2HJA—H. J. E. Allcock, PMB5067, Ibadan, Nigeria.
TL8SW—S. Wagoer, Box 302, Bangui, Central African Republic.
FS7MB—Via W3ZQ.
TT8AN—Via W0LYQ.
MP4QBF—P.O. Box 73, Doha, Qatar, Arabian Gulf.
ZS7R—V. V. Parkhouse, P.O. Box 99 Mbabane, Swaziland.
9Q5TJ—Via DJ4OP.
KV4DE—Via W4SWN.
VQ4I—Via R.S.E.A., Box 30077, Niarobi, Kenya.
3A2AF—Via W6SAI.
9L1TI—T. Lloyd, Fourah Bay College, Freetown.
FU8AG—Box 104, Santo, New Hebrides.
YK1AA—Box 35, Damascus, Syria.
PJ5MC—Via W3ZQ.
KG4BX—W2CTN.
6O1BW—B. Walton, C/o. Paul Smith Construction Co., P.O. Box 1393, Mombasa, Kenya, East Africa.
9L1HX—C/o. Police Hdqrs., Freetown, Sierra Leone.
YV0AA—Hammarlund Manufacturing C/o., P.O. Box 7388, G.P.O., New York, U.S.A.
HL9TF—Via W5MML.

The best one heard this month: A W who had just finished his home-brew 1kw. transmitter was on the air when his friend called around to see the new job. Owner had to go out for a moment or two so he asked friend to operate in his absence. Owner was going out of the door when friend calls for advice on what to do if anything should go wrong. Owner replied: "Aw, just toon for maximum smoke!"

Many thanks to all those who sent in items for this month. It helps a lot fellas. Please bear with me until we get the hang of things here. Thanks to Al 4SS, Ken 3TL, WIA-L4020, DX-Press, WA6TGY, DX Magazine.

With the bands on the improve, I'll say 73 for now, Bert VK5BB.

V H F

Sub-Editor: Len Poynter, VK3ZGP.

Very little news for this issue. The closing date of the last day in month inconveniences many. I must have my copy in by the 2nd of the month, so it is imperative that I have your notes by the end of the month.

By now we are using 52-54 Mc. and hoping that we are not knocking Channel O or vice versa. The 53 Mc. net in VK3 is gaining popularity and many have converted their 6 mx gear for this frequency of 53.032 Mc. More of our activities next month.

Included this month is an up-to-date list of officially ratified records of the longest distance v.h.f. contacts in Australia. When will they be bettered? It's up to you. Let's hear of your efforts. David 3QV is anxious to hear from you.—3ZGP.

LONGEST DISTANCE V.H.F. CONTACTS
At 24th February, 1964

New South Wales:
50 Mc. VK2ADE-VE7AQQ, 8/4/59, 7320 miles.
144 Mc. VK2ASZ/2-ZL3AQ, 31/12/61, 1342 mil.
1215 Mc. VK2ZAC-VK2ZCF/2, 4/3/63, 47 miles.

Victoria:
50 Mc. VK3ALZ-XE1FU, 1/5/59, 8418 miles.
144 Mc. VK3ZEA-VK4HD, 27/12/61, 954 miles.
288 Mc. VK3ALZ-VK7LZ, 10/1/60, 282 miles.
576 Mc. VK3AKE-VK3ANW, 11/12/49, 80.1 m.
2300 Mc. VK3XA-VK3ANW, 18/2/50, 9.0 miles.

Queensland:
50 Mc. VK4HD-W6PUZ, 13/3/58, 5272 miles.
144 Mc. VK4ZAX-VK7ZAO, 27/12/61, 1107 mil.

South Australia:
50 Mc. VK5KL-W7ACS/KH6, 26/8/47, 5361 m.
144 Mc. VK5GL-VK6BO, 30/12/51, 1322 miles.
288 Mc. VK5AW-VK3ZCG, 23/1/61, 262 miles.
1215 Mc. VK5LA/5-VK5ZCR/5, 4/1/62, 1.0 mile.

Western Australia:
50 Mc. VK6BE-JA8BP, 30/10/58, 5490 miles.
144 Mc. VK6BO-VK5GL, 30/12/51, 1322 miles.
576 Mc. VK6LK/6-VK6ZDS/6, 15/12/63, 101.1 m.

Tasmania:
50 Mc. VK7LZ-JA9IL, 3/12/59, 5426 miles.
144 Mc. VK7ZAO-VK4ZAX, 27/12/61, 1107 mil.
288 Mc. VK7LZ-VK3ALZ, 10/1/60, 282 miles.

Papua:
50 Mc. VK9AU-KH6DBY, 30/4/60, 4312 miles.

SOUTH AUSTRALIA

50 Mc.: With the impending loss of 50 to 52 Mc. a good deal of thought is being given to how the 52 to 54 Mc. band will be populated. Many folk advocate populating the band from 54 Mc. down so as to reduce Channel 0 t.v.i. and i.t.v. No definite decision has been taken in VK5 and no doubt our policy will depend on that adopted by the Eastern States, who are more concerned with Channel 0.

Several DX openings were available over February. VK8 was worked on the 15th and VK4 and/or VK6 on the 5th, 9th, 11th, 14th, 15th and 25th.

Gary 5ZK and Bob 5ZDX, along with several other generous helpers, have built a 50 Mc. converter and supplied instructions on a simple transmitter for VR2DI. This chap seems quite interested in 50 Mc. and made the initial approach, so here's hoping the sporadic E is kind to us. One thing is certain, Channel 0 will be a king size beacon for 50 Mc. buffs in JA, ZL, KH6, KR6, VR2, etc.

Tim 5TJ, near Clare, about 80 miles north of Adelaide, is working into Adelaide at good strength. Brian 5BI also works into Adelaide (from Clare) occasionally, but contacts here are less frequent as the video i.f. strip, which determines Brian's system bandwidth, results in a 20 or 30 db. reduction in signal to noise ratio. New stations on 6 recently include 5ZF (11w., 3 el. beam), 5ZR (on n.b.g.f.m.) and 5TJ.

144 Mc.: Peter 5FM works Col 5CJ in Mt. Gambier every morning at 0700 C.S.T. Pete is located high in the Adelaide Hills and beams in the general Melbourne direction for these skeds. Victorian folk are advised to listen for Pete at around 0700 C.S.T. on 144.18 (approx.). Chris 5ZFA, near Millicent in South East, is another good bet for VK3 2 mx men. Chris. is getting out nicely, but I don't know his frequency. David 5AW is back in Penola permanently, but is understood to be having a good deal of t.v.i. trouble.

Another new man on 2 is 5ZRB, near Lameroo, on 144.5 Mc. Several Adelaide chaps are using crystal controlled transceivers on 144, however stations answering these chaps have to v.f.o. up onto the frequency on which the transceiver transmits.

Oscar III. information suggests that this latest satellite is ready for launching soon. It will listen on 144.1 plus or minus 25 kc. and retransmit on 145.9 plus or minus 25 kc. With a bit of luck VK Hams should work several new countries on 144 Mc. when this thing goes up. Here's hoping we are told as soon as possible after launching.

General News: V.h.f. Group general meeting in February resulted in Brian 5TN being elected President. Gary 5ZK was Vice-President, Bob 5ZDX Secretary, and Mac 5ZLM and Eric 5ZEJ Councillors. Eric 5ZEJ and Gilbert 5GX are both erecting new sky hooks. Mait 5AO has had the t.v. transmissions running quite nicely on 432 Mc., he has been copied by 5ZJH, 5ZDZ and others. George 5ZEY, the other VK5 Amateur t.v. operator, has recently forsaken his hobby to indulge the sins of the flesh. This is deemed to be a no less rewarding pastime. 73, 5ZCR.

WESTERN AUSTRALIA

What do you think is the value of v.h.f. beacon transmissions? In W.A. the Group has run the 50 and 144 Mc. beacons over a number of years. During this summer those beacons have been absent. Did you miss them?

By now the beacons in W.A. should be back on the air. With the South Australian beacon it should be possible to obtain quick contacts with Adelaide Amateurs during the short openings which do occur—the most recent being February 15.

What is also needed is a systematic record of when the beacons are audible. This applies to country points as well as Interstate. A log of reception of say 6VF on 145 Mc. in any country town would be an interesting and valuable project.

The V.h.f. Group would, I feel sure, be happy to arrange with some interested person in a country town, the loan of a receiver so that the person could gauge whether coming on v.h.f. in that town would be worthwhile.

Better still, a recording receiver. Has any member a chart recorder available which could be coupled to a fixed tuned receiver?

50 Mc.: This band is still showing signs of life with openings on Jan. 18, 19, 20, 21, 24, 26, 27, 28, Feb. 3, 9 and 15. Openings were all to VK5 with generally the 5VF beacon being heard and only a few actual contacts made. One of the more interesting contacts was with 5LZ/P in the National Field Day Contest. Openings have varied in length from five minutes to over three hours (Jan. 28).

Beacons: After completing extensive checks on dummy load, the 50 Mc. beacon was installed at Bill and Aleen's on Sunday, Feb. 16. Unfortunately a keying defect occurred on Monday, Feb. 17, and until Mac 6MM returns from the country, the beacon will be off the air. An announcement will be made at the next meeting, but country members can be reasonably confident that it will be on by Feb. 24.

YOUTH RADIO CLUBS

Good news from Canberra this month—our third A.O.C.P. in the Lyneham High Y.R.C. Jim Watson sat in January and passed all sections. He received the news the day before his 16th birthday (is now in his last year at High School). He achieved this after only 12 months of keen interest in Radio, and the A.O.C.P. study in his leisure time has helped his school work—he is in the few at the top in Maths. and Science. His future is a toss-up between Radio Astronomy and Medicine. Jim hopes to be VK1JR—please give him a call. Also please notify me of all A.O.C.P's. from your clubs.

Hints to Club Leaders: Lads at this age CAN do A.O.C.P. if they are really bright and well up in their school work, provided parents and club leaders make sure that only leisure time is used and the study is completed before the final year of High School. If it cannot be completed before then, aim at the Y.R.C. Inter. or Senior Certificate together with the building of some units later to be used in the Transmitter and/or Receiver.

Apologies for an ambiguous paragraph last month. Somehow, the competition for the best c.w. operator lost the vital c.w. part. There will be two grades—Under 15 (Elementary Certificate necessary) and Over 15 (at least Junior Certificate necessary). It is probable that timed Morse tapes will be used. Likely competitors should be in training now.

Random news: Two ex Y.R.C. members gained first and third places respectively in their R.A.A.F. Radio Apprentices' Course at Laverton. They were Terry Crews (ex Gosford High) and Graeme Dennes (ex Taree High), both now being Corporals.

Some nice encouragement in VK2—full subscription in the W.I.A. awarded to Jim Watson (VK1JR); copies of Radiotron Designer's Handbook from A.W.A. for George 1GB and Roger 1RD; offer of a scholarship annually by the Australian Radio and Television College to a Y.R.C. type at about Inter. Cert. stage; three guineas prize for first to gain Inter., Radio-Telephony (Grade 3), and Wireless Telegraphy (Grade 3) Certificates; one guinea and box of parts for another Wall Chart competition. Surely other Divisions could do as much—some of this could be the Southern Mouse.

Did anybody write to Mr. Hiew in Johore? What do you think of a Novice Licence for a few of your lads? Wouldn't it help Science Education a great deal more cheaply than Sir Robert's £5,000,000? 73, 1KM.

The response to the Y.R.C. scheme has proved that Radio is a popular hobby but has increased the demand for experienced personnel who are willing to assist. We of the Amateur Service who have the most to gain by the scheme should pull our weight and help. You can help in one of several ways—

1. Give lectures to a club on radio theory.
2. Help teach practical work to a club.
3. Give demonstrations of Amateur Radio in action either at a club meeting or inviting two or three members of a club to your QTH periodically.
4. Keep the stores of the equipment officers full of discarded equipment, old radios, components, etc.

It is not fair that we allow the local science master, radio man, etc., to run these clubs unaided. When you do help you will find a reward that is hard to describe, but is possibly best expressed by the boys themselves. So read the article below written after a demo. at the Christian Brothers Y.R.C., Bundoora, Vic., then do something positive to assist the non Amateur who is battling on to help others learn your hobbies. 73, 3ZMX.

THE RADIO BUG COMES TO BUNDOORA

The seven members of the recently established Youth Radio Club at the Christian Bros. Edmund Rice College, Bundoora, shared an unforgettable experience recently. To some this marked the culmination of their struggle with the basic aspects of Radio transmission and reception and to others a stimulus to obtain a greater knowledge and experience of Amateur Radio.

The demonstration of an actual Amateur receiver and transmitter in action was made by Mr. Ray Ellis (3ZDE) and Mr. David Buck (3ZMX). Also present were Mr. Bert Haddrell (3ZFC) and Mr. Phil Lavery, the club's hon. instructors.

A five valve transceiver was installed and operated by Mr. Buck in one of the College dormitories and contact established with the mobile unit installed in Mr. Ellis' car, who then drove down the half mile long drive and stationed his car at the front gate of the property.

Under the guidance of Mr. Buck, each of the members "went on the air", although a little persuasion was necessary for some members to overcome their "mike shyness". Then to relieve Mr. Ellis, two of the club's members joined him at the mobile unit and assisted in answering queries from the members at the College.

Another Amateur, Mr. Allan Boyle (3ZNG) was heard on the frequency so he joined in for a three-way contact. Jumping at this opportunity to let their voices be heard by the world, three of the members promptly began to shower him with detailed descriptions of every radio appliance they had built. Mr. Boyle concluded his transmission by describing his equipment and improvements he was hoping to build in the future. The demonstration concluded with an inspection by all members of the tidy, compact, mobile equipment which Mr. Ellis had installed in his car.

Well, it was over, but in a couple of short hours everybody had learnt from practical experience the thrill of talking and being answered by someone using home made radio telephone equipment. We had previously been interested in Radio, but after this day we are keener than ever to study for our Amateur's licence so we may build and operate our own transmitter.

S W L

Sub-Editor: Ian Woodman, WIA-L3006

Greetings fellow S.w.l's. As you will note from the above beading this section of "A.R." has a new Sub-Editor to whom all notes for this page should be forwarded in future. Information from the various States is at zero, does the S.w.l. Group still exist in your State? Are New South Wales and Victoria the only active States? I would be pleased to receive notes from other areas.

In the absence of any news I may be able to persuade some S.w.l's. to do their listening on the 160 mx band, that is between 1800 and 1860 kc. The main requirement is an old broadcast set with an r.f. stage for preference. When you have it performing at maximum sensitivity by correct alignment of the i.f. transformers, then you can alter the r.f. section so that you can tune down to 1860 at least. If you have a signal generator or grid dip meter that covers this frequency, you are in business.

First set the aerial, oscillator and r.f. trimmers at half their capacitance, next couple your signal on 1860 kc. in to the aerial terminal via the output lead of your signal generator, or if using the g.d.o., then wrap six turns around the g.d.o. coil (insulated wire please) and connect one end of this coupling coil to the aerial terminal. The greater the output the easier it will be to find the signal. Set the tuning gang to minimum capacitance (plates out of mesh) and turn the oscillator core so that the inductance is being reduced—the core will be moving out of the oscillator winding—and you should hear the signal.

The next step is to adjust the aerial and r.f. coils by adjusting the cores so that their inductance is being reduced—the cores are moving out of their respective windings—and this will produce a peak in signal strength when correctly set on the 1860 kc. signal. The tuning gang is now set at maximum capacitance (plates fully in mesh), tune in a broadcast station in this tuning region and peak the aerial and r.f. cores for maximum signal strength of the station being received.

Set the tuning gang back to minimum capacitance where the 1860 kc. signal is, and you will have to turn the aerial and r.f. coil trimmer capacitors to bring the 1860 kc. signal up to maximum signal strength. If the trimmers cannot be peaked, you will have to alter the turns on the aerial and/or the r.f. coil.

Also of help to you in finding this 160 mx band are these signals which you may be able to hear at your location. On 1600 kc. is 3NE (Wangaratta, Vic.), the last station on the broadcast band. The frequency of 1610 kc. is used by six of the Royal Flying Doctor networks for inter-station communication. On 1615 kc. is a New Zealand Navigation Beacon using Morse identification of OR—a useful guide for working DX across the Tasman.

The Melbourne Metropolitan Fire Brigade can be heard on 1665 kc. using the call sign VKN8, and the outstations of the Port Augusta Royal Flying Doctor network use 1690 kc. channel. The yacht clubs in Victoria use the 1725 kc. frequency and are heard at the weekends when the weather is fine. On week evenings, the N.S.W. University transmitter VL2UV can be heard on 1750 kc. The frequency of 1760 is allocated to Fishing Trawlers, and the Amateur band commences at 1800 kc. The Victorian Division have a network operating on 1825 kc.

NEW SOUTH WALES

It is pleasing to see that during the first two months of 1964 a keen interest is being taken within VK2 as evident by the increase in mail from S.w.l's. in this State, also requests from VK4 and VK7 for the three-transistor circuit, and the aerial booklet.

Thanks to the fellows for their letters, and trust that my replies were to their satisfaction. Don L2022, the No. 1 S.w.l. in VK2, recently heard on 14 Mc. AP5, 5R8, 5S7, UM8, OZ5 and HB9, and now has 274 countries heard. Sid L2258, our President, is taking his rx to Sussex Inlet where he will spend his annual leave. A new aerial is being erected by Norm L2251, now in VK4. We hope details of the aerial and DX heard by it will appear in this column in future. Russell L2262 uses a modified AR8 with a half-wave dipole on 14 Mc. and he has heard II, G8, G5, G3, UA4, UQ2, KW6, HP9, VU2 and PY. Exams have kept Ross L2233/VK4 off the air for a few months—we wish you well Ross with the HE30.

Chas L2211 tells of a prominent radio listener who was heard telling our Secretary "you know that article about obtaining a booklet on aerials, well I have been dialling L2211 all day and no one answers." There are a few copies of the three-transistor circuit and aerial booklets available, so just write to me if you want one, enclosing a postage stamp. Other persons heard from were Keith L2269, Brian VK7, Ross Beckley, D. Robertson, Geo. Barnes and Bro. Kinsella (2AXK). 73, L2211.

DX LADDER

	Countries Conf.	Hrd.	Zns. Conf.	S.s.b. Conf.	Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	274	38	20	104	35
A. Westcott	93	159	31	9	107	11
M. Hilliard	84	285	33	34	168	12
P. Drew	88	234	29	37	185	24
M. Cox	80	232	31	49	163	21
C. Aberneathy	57	100	31	—	—	—
G. Earl	48	147	26	30	123	5
N. Harrison	44	119	29	4	20	35
I. Thomas	42	139	20	16	97	14

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NEW CALL SIGNS

DECEMBER, 1963

VK2MR—Mrs. Verle Weston, 6/273 Anzac Pde., Kingsford.
VK2OO—R. K. Seppala, 80 Bridge Ave., Oak Flats.
VK2ALL—E. G. Clare, Station: 5 Palla St., Griffith; Postal: P.O. Box 146, Griffith.
VK2ASH—J. A. Hodgson, 141 Grove St., Kooringal, Wagga.
VK2AYK—A. F. Jacobson, 9 Ormonde Ave., Epping.
VK2AYT—H. A. Lilley, 206 Eastern Valley Way, Willoughby.
VK2AYX—R. D. H. Sides, Kingston Park, Goolgowi.
VK2ZDR—G. A. Cruickshank, 26 Killara Ave., Riverwood.
VK2ZDW—D. J. W. Walker, 53 Gordon St., Rosebery.
VK2ZHG—H. A. Grouse, 17 Ivanhoe Street, Marrickville.
VK2ZLJ—L. D. Jennings, 62 Unwin St., Bexley.
VK2ZML—M. L. Steward, 68 Westbrook Ave., Wahroonga.
VK2ZRY—R. W. Young, Myall Place, Engadine.
VK3ADT—A. M. Brighton, Lubeck.
VK3AFR—G. R. O. Farthing, 12 Moffatt St., Avonsdale Heights.
VK3AYM—Gowrie Park State School Youth Radio Club, Morrel St., Glenroy East.
VK3YX—L. H. Weller, 46 Pepperall Ave., Syndal.
VK3ZAT—A. Schellaars, 8 Queen St., Moe.
VK3ZBH—G. S. Hart, 73 Harrison St., Box Hill North.
VK3ZRX—D. M. Bennett, 367 Clayton Rd., Clayton.
VK3ZSW—A. S. Waight, 12 Arameln St., Shepparton.
VK4FX—M. L. Downing, 7 Svenssons St., Bundaberg.
VK4TG—D. G. Taylor, 10 Angela St., Salisbury.
VK4ZPL—P. J. Lindsay, 82 Iliowra St., The Gap.
VK5BI—B. J. Warman, Victoria Rd., Clare.
VK5GO—G. A. Middleton, 10 Struan Ave., Enfield.
VK5GW—E. C. Schmidt, 362 Chitunga Rd., Eden Hills.
VK5OF—D. W. Avard, C/o. Mrs. Fooks, Warooka.
VK5YB—B. A. White, 53 Mitcham Ave., Lower Mitcham.
VK5ZMZ—R. M. Olesnicky, 35 Edwards St., Col. Light Gardens.
VK5ZRH—J. R. Harris, 1 Elmo Ave., Westbourne Park.
VK5ZSJ—J. L. Sinclair, Mil-Lel.
VK6MP—M. T. K. Power, 6 Richardson St., Carnarvon.
VK6QJ—G. P. Hunt, 64 Tuckfield St., Fremantle.
VK6ZW—J. A. R. Smith, Flat 2B, Commonwealth Hostels Ltd., Alfred Rd., Graylands.
VK6ZCN—A. L. Martin, 15 Haig St., Bunbury.
VK6ZEB—K. J. Chipper, 19 Joseph St., West Leederville.
VK6ZEZ—G. H. Sturcke, 61 Margaret St., Cottesloe.
VK7ZMH—M. J. Hart, 97 Norwood Ave., Launceston.
VK7ZRG—R. N. Gatenby, "Cressy House," Longford.
VK9EP—E. A. Parker, Ialibu S.H.D., Via Mt. Hagen, T.P.N.G.
VK9WE—W. A. Easterling, Port Moresby, T.P.N.G.
VK9LF—L. F. Fracek (Rev.), Kondiu, T.P.N.G.
VK9TG—T. V. Gencuski (Rev.), Banz, W.H.D., T.P.N.G.
VK9ZGB—G. R. Barkworth, Boroka, T.P.N.G.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

AUSTRALIAN D.X.C.C.

Editor "A.R.," Dear Sir,

The suggestion put forward by Bram Jellett. VK5AB, in the March issue of "A.R." relative to the number of "available" countries is very good, but unfortunately it does not go far enough.

If VK5AB's intention is to place everyone on an equal footing and thus give VK3XYZ, who will be licensed next month, the same opportunity as VK3CX (who was licensed in 1928), he would have to further revise the list so that those countries which are at present not represented by Hams on the air are also deleted from the list.

In this connection I refer to places where the only activity has been as the result of DX-peditions—some readily come to mind such as Bouvet, Nauassa, Swan, Revilla Gigedo, Assumption, Aldabra, Rodriguez, St. Brandon, Aves, Clipperton Islands, etc., etc. I have listed ten only, but there are many more.

None of these are available to the Ham who starts next month—true, they may possibly be activated again at some future date, but at present they do not exist.

It follows therefore that we must take these off the list if such list is to be a true reflection of what is available now.

I trust VK5AB will see that the thing would get a little cumbersome if you had to revise the list every month, depending on current DX-peditions.

On the other hand you could quite easily add a few more countries to the list now that A.R.R.L. has granted separate country status to an office building in Geneva (I.A.R.U. Hdqrs.), and grant similar country status to each foreign embassy in every country of the world. An embassy owns the land on which it is situated in the name of its own government and therefore becomes a new foreign land, e.g. the Australian Embassy in Washington D.C., U.S.A., would be "Australian U.S.A.", or the French Embassy in Canberra would be "French Australia". Each of these could be visited by W4BPD in turn and thus add another 1,000 or so new countries to the list. It is just as logical as adding an office building in Geneva.

In addition, each of the Bases in Antarctica could be called a separate country—each is operated by a different foreign power and I cannot imagine why A.R.R.L. has not done this already.

If, however, the list is shortened, then the larger figure should include all countries worked "all time," i.e. since the applicant came on the air—why pick World War II. as a commencing point? Some of us could add Danzig and other places which disappeared.

One other point to be considered is the frustration of the top DXers who find when they have worked all countries on the list, that they no longer have anything to hunt.

My advice to VK5AB is to do what I did and that is to set yourself a target (in my case it was 300 countries), and when you reach that target you retire gracefully. At least there will be some countries left should you ever change your mind.

—Alan Brown, VK3CX.

SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R.," and back copies may not be available upon request. To preserve continuity of your files of "A.R.," please pay your annual subscription now.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

Details of the annual U.S.S.R. world-wide DX Contest are to hand. The contest period is from 2100z, May 9, to 2100z, May 10, and only 12 hours of continuous operation can be claimed. Full details from this Bureau.

The W3 QSL Bureau is now located at P.O. Box 204, Chalfont, Pa., 18914, U.S.A.

The following ex Finnish Amateurs are now permanently resident in Australia: OH4NT (now VK2OO), OH2NX (now VK5NS) and OH2KJ (now VK5EX).

The CR7 QSL Bureau is now located at Box 161, Beira, Mozambique.

The Aruba Amateur Radio Club announces details of its Aruba, Aribа Award. Details from this Bureau.

Paul Thompson, ET3PT, in acknowledging receipt of information as to the best time and band for VK contacts, states that ETs 3AV, 3GC, 3HO, 3HP, 3JK, 3JW, 3MEN, 3PT, 3RR, 3RT and 3USA are all active. States that best time for ET/VK QSOs is (phone) 1300-1500z.

The new address for the Aruba (PJ2) QSL Bureau is P.O. Box 273, San Nicolas, Aruba, Netherlands Antilles. QSL manager is PJ3AO.

The Singapore Rag Chewers Club announce a new certificate for rag chews with club members, VS1CM, JG, KA, GQ, DD, DK, JW, LG, LT, LU, LV and MC. Details from this Bureau.

Many thanks to Mark, VK2CM, for promptly supplying the call sign and QTH of ex OE1IW, who is now VK2KM. Seems that one or two do read these notes!

Details of the Budapest Radio Club's Budapest Award may be had from this Bureau.

Writer spent the first week of March camping alone in the bush in the Maryborough (Vic.) area. Due to the absolute lack of any surface water, the prime objective of the trip —alluvial prospecting—was entirely defeated, but gave time for meditation, catching up with the backlog of Ham literature, and visiting the stamping grounds of his youth and hunting for the old orchards he raided as a boy. Latter are now non existent and forcibly reminded writer what changes occur in the passage of half a century. A new Federal QSL Manager was almost necessary for at 0300 one morning a big dry limb of a tree, under which the camp was sited, broke with a tremendous report, fell on the tent tearing fly and tent, and ended up one foot above writer's head! However, worst feature of the trip was being forced to listen to 3.5 and 7 Mc. phone on a s.w. transistor!

Statistics for the W.I.A. year ending Feb. 1964 show that 50,000 cards were handled by this Bureau, as compared with 47,000 and 44,000 in the two immediately preceding years. Peak year was in 1947/8 when 65,000 QSLs passed through. Writer has graph of handlings since 1947 which shows the trough in 1953/4 when only 20,000 cards came in for handling. When space is not so tight, will publish the graph which may give the 11-year cycle students food for thought.

Winner of the 1963 "CQs" offered in these notes in March "A.R." was VK3TL with a consolation to L3158. Better luck next time to the other eight applicants.

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NEW SOUTH WALES

HUNTER BRANCH

The annual general meeting, which was held on 6th March at the Technical College, was conducted in the usual democratic manner. The Divisional President (Vic. 2VL) took the chair after Les 2RJ had presented his report as retiring Branch President. Les gave a very detailed report of the year's proceedings and urged all Amateurs to use all the frequency allocations available, having consideration to the pressure being exerted on band space. Les also pointed out that the Branch had had a most successful year as far as attendances at meetings, the average being 40 present at each meeting for 1963. A vote of thanks, carried by acclamation, was later made by Bill 2XT in recognition of Les' wise leadership during the year.

So fast was the voting that Vic. had to get all the details down in shorthand and then ask the boys what he had written when it was all over. Those who have taken office for the new term are: President, Frank 2APO; Vice-Presidents, Lion 2CS and Keith 2AKX; Hon. Sec., Gordon 2ZSG; Hon. Treasurer, Bill 2XT; Zone Correspondent, Keith 2AKX; Social Sec., Max McLachlan; Social Treasurer, Kev. 2ZKW; V.h.f. Liaison Officer, Des 2ZDN; and QSL Officer, Stan 2AYL.

Following his election as President for the ensuing year, Frank gave a short address assuring members of his desire to continue the excellent work of the past which has resulted in the Branch being one of the most progressive in Australia.

At the conclusion of the A.G.M. the ordinary monthly meeting was held and then followed a programme of films kindly arranged by John 2XQ, and in the capable hands of our official projectionist, Rodney 2CN. Des 2ZDN also played an historic tape recording of a conversation on 432 Mc. between Sydney and Newcastle.

The Branch station 2AWX has completed tests on 160 mx and now uses 1820 kc. as well as 3595 kc. for the Monday night broadcast. In addition, there is a relay by Gordon 2ZSG on 144.443 Mc. The new top band frequency is being well received in all parts of the local area and members having difficulty in copying the 80 mx signal are advised to try 1820 and hear the difference. The operators of 2AWX are anxious to receive reports, especially from local members and listening watch is maintained on the three frequencies during the call-backs. Broadcasts commence each Monday at 1900 E.S.T.

Following the October examination for the A.O.C.P., Paddy Maloney of Toronto has been notified of his call, 2AXU. At present, Paddy is working 40 and 80 with low power, phone and c.w. He is very keen on c.w. and would appreciate a call. Ron 2ASJ is now back on 2 mx and is getting good reports, thanks to the efforts of Doctor Mac 2ZMO. Bill 2XT has been using the s.s.b. rig of late and has had some very encouraging reports of good signals. Belmont Bob and Max, Susan and Jan are all anxiously waiting the results of the A.O.C.P., and if all goes well for them there should be no lack of signals as a big building programme is in progress.

Please don't forget that the next meeting is to be a week later than usual so that Les Jenkins, the lecturer, may attend the v.h.f. group meeting which coincides with our normal first Friday. This means then that Friday 10th is the date and the lecture is about receiver front ends. Make a note of the change and please try to be there to hear a most interesting lecture. We'll all be in Room 15 of the classroom block at the Technical College, Tighes Hill, at 8 p.m. on the 10th. Next month the meeting night will revert to its usual time. May we expect the pleasure of your company? You are assured of a good time, so see you there, 73, 2AKX.

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VICTORIA

MOORABBIN & DISTRICT RADIO CLUB

January through March has been quite an eventful time for our Club. The effort for the National Field Day resulted in a score which far exceeds our last year's total, and we are optimistic as to the competitive result. The party participating were formed into three groups, all within the radius as prescribed in

SILENT KEY

It is with deep regret that we record the passing of:—

VK2OA—Bob Winch.

the rules. Kevin 3ARD headed the first group operating 14 and 60 Mc.; Ken 3ACS the second group operating 21, 3.5 and 1.8 Mc.; Alf 3LC the third group operating 144 and 7 Mc. 144 Mc. did particularly well under the leadership of Ken 3ZNJ. Those other members helping were Harold 3AFQ, Ray 3JI, Bill 3CB, Clive 3LZ, Wally 3AHZ, Graham 3ZMQ, Graeme 3ZIP, Bob 3ZRD and quite a few junior members. In all, everything went off well without undue stress, and all members had a jolly good time.

On Friday evening, March 6, a 3.5 Mc. tx hunt was held. Harold 3AFQ and Ken 3ACS hid the tx on the beach at Black Rock, only a mile or so from our rooms. They confused the issue by reducing power to a minimum, and using a four foot vertical antennae, with the result that Peter 3APD was the only member that found the tx.

On Saturday, March 14, the Club collaborated with the committee of Haleybury College in South Rd., Brighton, in putting on a working display of Ham Radio. By the interest shown by parents as well as students, the effort was most successful.

Coming events: Friday evening, April 3, a White Elephant Night. Saturday evening, April 4, the first of our series of Social Evenings, being held at the home of Harold 3AFQ. Friday evening, April 17, our general meeting at which a lecture on computers will be delivered. These three events are in the upper bracket, so I urge all members to endeavour to come along. 73, 3LC.

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QUEENSLAND

TOWNSVILLE AND DISTRICT

Here I am back again in the north after a sojourn in the southern State. Now don't tell me Melbourne cannot get hot as it was 103.3 while I was there and when I complained, was promptly told it must be hotter in Townsville as it was closer to the equator. Little do these people know their own country, as I have never seen the century at my humble abode. Even had a swim the following day at their far-famed St. Kilda Beach and it was again over the century. As I managed to have my holidays between the cyclones Little Audrey and Dora, all was well.

In Sydney my trusty chauffeur 2AJL was there to take me around and visit Dural 2WI. What a hard job I had to talk Jim Corbin out of having me on the end of the crow bar as he put in a few posts. Needless to say, Perc Healy blew along and saved me sweating in a good cause.

Managed to fit in a tour of the boys in the Northern Tablelands, Atherton, Cairns, etc. While in Cairns took the opportunity to meet the Z boys who assured me the present Ross Hull Contest gave them better contacts than last year. As I was lucky to crack that elusive VK6 and VK8, hope to worry Alf for that W.A.S. Boy, did it take a long time to work—seven years.

Local activity in Townsville is in the doldrums as only three stations heard on the bands. What a poor show. Charlie 4BQ putting a tower together to support a 7 Mc. quad. What for? Pertinent Question, can anyone tell what will happen to the t.v. viewers on the fringe area of Channel 0 when the sunspots increase in a few years time and the JAs pound through?

The twisted pair must be broken as nary a word from the Burdekin area. Maybe gravel-voiced Claude too busy or has the job got him down at long last? 73, 4RW.

— • • • —

TASMANIA

Only seven nominations for the 1964-65 Council were received, and were duly declared elected by the Returning Officer. The names are as follows: Tom 7AL, Snowy 7CH, Charlie 7KS, Ted 7EB, Terry 7CT, Geoff 7ZAS and myself 7ZZ. This means that Len 7LE and David 7ZAI did not seek re-election. We welcome the two new members to Council, Charlie 7KS and Geoff 7ZAS, and promise plenty of work for you both, being certain that you both will assume that responsibility gladly.

We say farewell from Council to Len and David. Len has for many years been minutes secretary and has fulfilled this post admirably, while David has been on Council just one year. We understand David's decision not to stand again was in view of his frequent absences from Hobart at the direction of his employer. David has also been the contributor of the technical articles to our monthly bulletin.

Amateurs seem to be moving around the State very much these days, and we note the removal of Graham 7ZBR and Tony 7ZTC to Hobart from the Launceston area, and the move from Hobart of Reg 7ZAO to Latrobe, and Michael 7ZAV and Snowy 7CH both to Burnie, and wish all success to each of you in your new locations. Snowy's (7CH) move from Hobart will deal a severe blow to the Institute as Snowy was re-elected to the new Council.

The following important jobs will now have to be filled, namely, Treasurer, Bulletin Editor and Convener of the Disposals Committee. In these three jobs and in many other active ways, Snowy has played an unobtrusive but invaluable part in our affairs.

The VK7AJ Memorial Contest has passed again with considerable activity on the Sunday (1st March), but disappointing activity on the Saturday (29th February). We were delighted to have the participation from northern stations in this contest, but lack of activity on the v.h.f. bands was again noticed. Great fun was had by all taking part, and we suggest to you that you prepare for this event next year.

The National Field Day Contest was disappointing this year because of the terribly wet conditions throughout the State which severely curtailed portable and mobile activity on both the h.f. and v.h.f. bands in this Contest. 73, 7ZZ.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 5th of the month, and remittance should accompany the advertisement. Call signs are now permitted in Hamads. Dealers' advertisements not accepted in this column.

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FOR SALE: Transmitter: Geloso v.f.o. to 2E26, 25 watts, 80-10 mx, complete with modulator, power supplies and antenna c/o. relay, in very nice two-unit rig, £30. Transmitter: 160/80 mx only, v.f.o. controlled, 70 watts c.w., 70 watts peak a.m., gated screen modulator, complete with power supplies, modulator and antenna c/o. relay, £20. Hepburn, VK3AFQ, Phone 96-2414 evenings.

FOR SALE: VK6GU 4-element Tri-band Beam complete low-loss feeders, excellent condition, £15. Hilco 1400-700-400 aside 200 mA. Transformer, £6. Other gear cheap. J. Mabbitt, Phone 84-7360 (Vic.).

HAMMARLUND Super-Pro Receiver, U.S. Navy model. Would appreciate any circuit and wiring diagrams and any other info. Write Bev. Davey, VK4BL, 9 Balding Ave., Werribee, Vic., stating price.

SELL: Complete chassis mounted power supply, tapped 500-600-750-1000 v. 350 mA.; filaments 5v. 4a., 6.3v. 4a., 6.3v. 4a., 16v. 1a; tubes two 5R4GYs, with chokes and condensers, 100% working, £16. Ditto to above but 900v. 300 mA.; filaments 5v. 4a., 6.3v. 4a., 6.3v. 4a., 16v. 1a.; tubes two 866s, 12v. d.c. relay supply with chokes and condensers, 100% working, £16. Ditto to first above but 300v. d.c. at 300 mA., 150v. d.c. regulated, —150 bias, l.t. 12v. a.c., 12v. d.c.; tubes, two 83Vs, one 6X5, one OD3; with swinging and filter choke, made especially for SCR522 equipment, 100% working, £15. Modulator, 75w. Class B 807s (A. & R. kit), complete with tubes 6J7, 6SQ7, 807, two 807s, volume expander incorporated, with 0-300 mA. plate meter, £15. Filter Condensers (eight), 2 uF. 3,000v. d.c. working, £16 lot. Power Transformer, 1600-0-1600 v.a.c. 500 mA. (Pye made), £8. Write or phone VK3ML, 384 Glenferrie Rd., Malvern, Vic. 42-1614 day, 50-6397 night.

SELL: Heathkit "Apache" and SB10 Xmtr., built-in pwr. supply. Heathkit "Seneca" v.h.f. Xmtr., 6 and 2 mx., built-in pwr. supply. Electronic Ant. TR switch. Offers to S. E. Widgery, 39 York St. West, Ballarat, Vic.

SELL: Radio Amateur Callbook, foreign section, Spring '63, Fall '62 and U.S.A. section Fall '62, each 10/- plus postage. Five-stage two-metre Xmitter with 832 (no pwr. supply) and 10w. modulator (UM1) with pwr. supply £12 O.N.O. Various pwr. and fil. xformers, Eddystone xmitter condensers, c.r.o. tubes and mu-metal shield, 12v. genemotors, textbooks, valves, oddments. VK3AWS, 11a Maud St., Ormond, Vic.

SELL: 8" T.V., excellent condition, conventional miniature tubes in circuit, incremental tuner, circuit available, weight approx. 15 lbs., works well on 115v. supply converted from car battery, drain 120 watts. Write E. Parow, P.O. Box 164, Leongatha, or Phone Leongatha 2485. Price £75 or offer.

WANTED: Commercial S.s.b. Transmitter, state make, input, condition and price. Sell: 33 ft. oregon tapered mast (solid), almost new, £7½. VK3AVU, 200 Elgar Rd, Box Hill Sth., Phone 28-2785 (Vic.).

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MAY 1964

Vol. 32, No. 5

2/-

Registered at G.P.O., Melbourne, for transmission by post as a periodical

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1K7	5/-	5 a £1	6AB7	10/-		6H6GT	3/6	7 a £1	6X5	15/-		14A7	3/6	7 a £1	1626	5/-	5 a £1	KT61 (6V6)		15/-
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1LN5	(CV781)		6AG5	5/-	5 a £1	6J6	20/-		7A8	2/-	11 a £1	30	1/3	18 a £1	2051	5/-	5 a £1	QQV06/40		97/6
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8	600	6/-	32	350	8/6
10	12	3/6	50	12	3/6
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16	600	8/6	100	6	4/-
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"AMATEUR RADIO"

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THE EDITOR,
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P.O. BOX 36,
EAST MELBOURNE. C.2, VIC.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

★

OUR COVER

This month the cover illustration shows an almost full scale photo of a night spider. This has been chosen because it provides a direct comparison with the actual sizes currently being used for many electronic components or parts. In fact, modern electronics today uses parts which are far finer than the spider's web shown on our cover. Many transistors use tolerances which make the thickness of a web seem coarse.

FEDERAL COMMENT

★

HOW TO KILL OR BUILD AN ORGANISATION

When conditions on the Amateur bands are bad or there is a sunspot minima as we have at present, Institute activity generally seems to decline. It is at these times when one hears complaints, rumours and other wild mutterings. It is a case of "idle hands get into mischief". This state of affairs is common with all organisations, and at some stage or other when a general stasis applies a glorious lassitude pervades the membership in their attitude towards their club or organisation.

It is similar with the W.I.A. and it is now that the members should be wary—they should be bestirring themselves to create interest and not kill it. The quickest way to "kill" any rehabilitation process is to adhere to the following ten rules (with apologies to the U.S. Magazine Popular Gardening):

1. Don't come to meetings, but if you do, come late.
2. Find fault with the officers and other members; particularly on the air.
3. Never accept office; it is easier to critise than to do things.
4. Nevertheless, get annoyed if you aren't appointed to a committee.
5. If appointed, don't attend the committee meetings.
6. When asked to express your opinion, say nothing but afterwards tell everyone how things should be done.
7. When others roll up their sleeves to help, say the Institute is run by a clique.
8. Never write a magazine article; it's too much of a bore.
9. Hold back on your dues as long as possible, or don't pay at all.
10. Don't bother about getting new members, but if you do, be sure they are moaners like yourself.

Fortunately, we believe there are very few Organisation Killers amongst us, but in times of inactivity, beware. The Organisation Killer is an insidious disease and can become epidemic.

We would like to believe that every member of the Institute was the direct antithesis of the OK, and it does not really take any great effort to become so. Beware of that feeling of complacency that advises there are plenty of others to do the work. There is always some job in the Division you can do, and to quote the old proverb—Many hands make light work. Too often too much is left to too few.

So we suggest that you offer your assistance to your Divisional Council and you will find them only too willing to accommodate you in some way; don't be shy about coming forward to help when assistance is required—you may find you may hold an important office yourself in the near future; become a real Organisation Builder and not a Killer.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

THE "TETRA-LINEAR"

A "Passive-Grid" Linear Amp. using four EL38s in Parallel (tamed)

PHIL WILLIAMS, VK5NN*

THE exciter at VK5NN uses a 6146 with about 80-100 watts peak input which has done very well "DX-wise" during the past six years, but with deterioration of the h.f. bands, it was found to be struggling. So designs were started for a linear which would meet the following specifications:

- It would need to fit into the remaining 8" width of shelf space beside the exciter and AR88 receiver, so 18" of depth and 10½" of height were available.
- There should be no very high voltages employed and a readily available and replaceable transformer used.
- There should be no large tungsten filaments and the associated heat dissipated in the shack.
- Silicon diodes should be used with the same object in view.
- The power supply should be within the amplifier case.
- Small transmitting tubes or large t.v. line-time base tubes should be used to keep initial and replacement costs down.
- A 70 ohm nominal output impedance pi-network should be employed with universal matching on all bands from 10 to 160 mx.
- There should be no input tuned circuits.
- It should not be necessary to use large transmitting components.
- The need for neutralisation should be avoided.

The above ruled out the use of 813s, 805s, 866s and the like, high voltage transformers and h.v. block condensers.

Surveying the literature, the Globe LA-1 Linear, described in Stoner's New Sideband Handbook, using four EL38 line-time base tubes at 25/- each caught the eye and appeared to fit into the space available. A standard 17" x 8" chassis was purchased and 8" x 10½" trays fitted to make front and rear panels, with ¾" aluminium angle on the top side corners to stiffen the assembly. The top cover (top and two sides) of perforated metal is bent to fit over the angle and fixed to the sides of the chassis with three screws on each side.

The amplifier was first wired as a grounded grid device but otherwise in accordance with the circuit and layout shown. It worked, but loading of the exciter was unsatisfactory because of the change of loading with drive level, as well as some instability when exciter and output pi-networks were not tuned in accordance with settings which were marked after much experiment.

* 37 Winns Road, Blackwood, South Australia.

It was then realised why these LA-1 linears are so cheap on the U.S. second-hand market, but in an attempt to "save the day," it was decided to rewire the tubes for passive-grid operation, i.e. with 210 volts on the screen grids, fixed grid bias, and 75 ohms of carbon resistor at the grids.

These changes proved so beneficial that the amplifier has remained in this condition and performed with complete stability ever since. The 75 ohm 10w. grid resistor loads the exciter perfectly at all times whether the linear is switched on or off, and no grid or cathode tuned circuits or pi or L networks are required, with their attendant handswitching complications.

Visitors' comments and many queries over the air have prompted this write-up for "Amateur Radio". Several similar amplifiers have been built using the same EL38s, another with 807s, and yet another variation with the single-ended KT66s, all of which work so well that this general design appears to be universally adaptable. The KT66 version is known affectionately as the "Humpty-Dumpty" linear as the four tubes are sitting up on a vertical partition 1½" high, with grids one side and anodes the other.

DESIGN OF THE AMPLIFIER

The EL38 characteristic curves under conditions given for G1 and G2 voltages give a peak anode current of about 375 milliamps. at the knee of the curve at 0 grid volts.

The load line drawn on the curves indicates an R_L of 6,000 ohms, so that the pi-network for an amplifier using four of these valves in parallel should be designed for R_L = 1,500 ohms with Q = 12. Where the output capacitance is irreduceable on 10 metres the Q is allowed to rise to 15, and where the plate tuning capacitor's maximum value is inadequate on 160, metres, the Q is allowed to be lower, with little degradation in quality.

Band	Total Capacity	Inductance	Loading Capacitor	Q
160	380 pF.	32.0 µH.	2000 pF.	8
80	280 „	8.5 „	1300 „	10
40	180 „	3.2 „	750 „	12
20	90 „	1.6 „	370 „	12
15	60 „	1.08 „	250 „	12
10	45 „	0.8 „	185 „	15

Table 1.—Pi-Network Data.

With correct loading the amplifier will allow the plate current to rise to a peak **instantaneous** value of 1,500 milliamps., so that a peak input of about 500 watts is possible in an amplifier with a total plate dissipation rating of 80-100 watts, and using a plate transformer rated at 80 watts (h.t. winding only), viz. 400v. at 200 mA.

In order to keep the amplifier from being overloaded thermally, the meter readings kick-up to about 150 mA. on speech, at which current, the peaks may be 1400 or 1500 mA. of total cathode emission. It is surprising to notice that at such values the plates show no colour, and the transformer does not become overheated. The amplifier should never be run at full input, indeed it cannot, as the power supply regulation will not permit it, the plates will colour-up to give you warning, and something will go "phut!" or melt.

Thus our objective of designing a linear amplifier for s.s.b. speech, which would take about 150 watts. average input on peaky male speech with about a 25% duty cycle, without flattening, and without overheating, has been achieved.

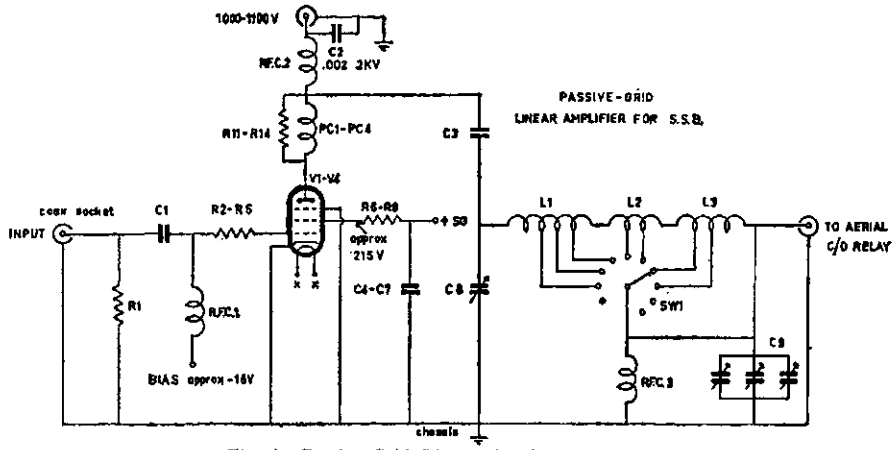


Fig. 1.—Passive-Grid Linear Amplifier for S.s.b.

The circuit diagram shows the method of obtaining and regulating the voltages. It will be noted that capacitors—large electrolytics—are considered the cheapest and best method of achieving the dynamic regulation necessary. Static regulation is rather unimportant. "On the air" tests and reports have given a clean "bill of health".

In order to reduce intermodulation distortion at low levels, the plate current is set at 60-80 mA., i.e. 15-20 mA. per tube, in the quiescent condition. This is not switched off when not transmitting as the amount of heat liberated is no more than from a soldering iron.

The power supply uses twelve silicon diode rectifiers, three in each leg of the bridge, with the usual 1,000 pF. ceramic and 470K resistor across each 400v. p.i.v. rectifier unit. Those used are an odd mixture of HR25s, 1N1763s and OA210s. The bias supply voltage doubler employs two more, and 100 μF. condensers, giving 28 volts into the bias pot.

The main h.t. supply is about 1,080 volts on no load, dropping to just over 1,000 on speech, with 45 μF. (measured) in the filter, which is built onto a sheet of bakelite, and insulated from chassis. There are five 200 μF., 275v. peak, 200v. working, capacitors in series with a 100K 1w. resistor across each condenser to equalise their potentials and discharge them when not in use.

This is a **dangerous** item, and the amplifier should not be switched on unless the **cover is on**—protecting the operator from the valve anodes and condensers, and, incidentally, preventing the large peak amounts of r.f. it can generate from getting into the exciter sitting next to it, via the microphone lead and other inter-connections.

The usual grid, screen and anode parasitic stoppers were all used as a precaution, but the cathodes are solidly grounded, using short strip connections. The old bakelite wafer octal sockets are preferred for this job.

Screen current peaks are very high, although the average value measured is only tens of milliamps. In order to achieve adequate regulation without the VR tubes becoming extinguished, a 200 ohm resistor in the ground end of the VR tubes has 7 volts drop with the 35 mA. of current through the VR tubes under quiescent conditions. The screen current peaks are supplied by the 200 μF. condenser and it is re-charged as current is diverted from the regulator tubes to the condenser. The voltage drops from 217 to approx. 212 without the tubes going out—a crude but effective method of achieving 3% regulation—which is quite acceptable.

The amplifier is operated without any grid current whatsoever, so smoothing of the bias supply is more important than regulation. 500 to 1,000 μF. is cheap for this supply, and it will be noted that the bias is applied before the cathodes come up to temperature. The heaters are **earthed** only via the bias supply, but this does not adversely affect performance. Switching in the h.t. winding is unconventional, but the switch should be a large fast-operating toggle; perhaps separate transformers for h.t. and heaters would be better.

(Continued on Page 5)

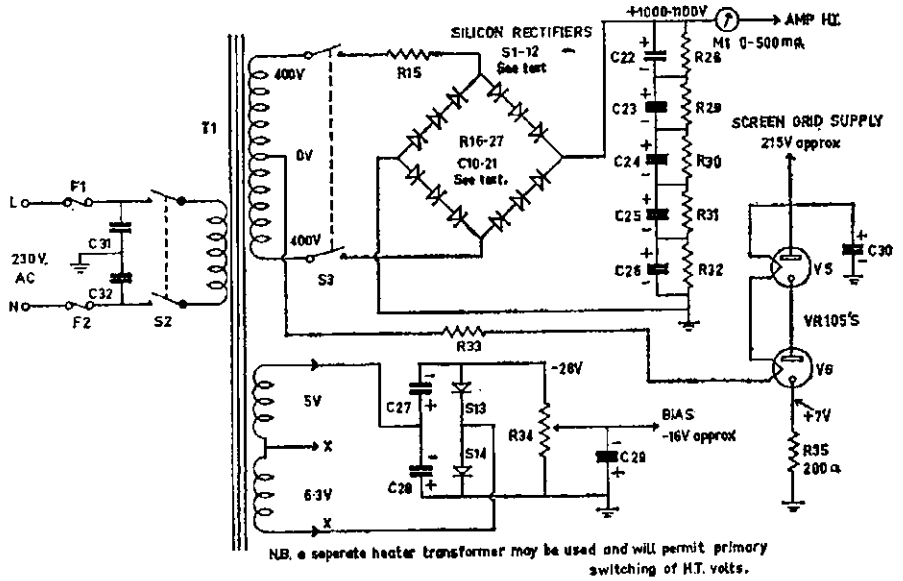


Fig. 2.—Power Supply for Passive-Grid Linear Amplifier.

PARTS LIST FOR "PASSIVE-GRID" LINEAR AMPLIFIER

C1—0.01 μF. Hi-K disc ceramic condenser.

C2—0.002 μF. x 2 kv. working Hi-K disc ceramic condenser.

C3—0.002 μF. x 2 kv. working Hi-K disc ceramic condenser (may be mica if a suitable unit can be found).

C4-C7—0.005 μF. Hi-K disc ceramic condensers, four off.

C8—14-360 pF. tuning capacitor, plate spacing at least 0.026 inch—ex disposals equipment, e.g. "Gibson Girl" transmitter, or re-insulate an old b.c. set condenser with low minimium C.

C9—Three x 500 pF. b.c. gang, A.W.A. (ex AR8 l.f. tuner). C9 may need to be supplemented by an additional 1,200 pF. external mica condenser on 160 metres.

C10-C21—1,000 pF. Hi-K tubular ceramic condensers, twelve off—one across each silicon rectifier unit.

C22-C26*—200 μF. 200 v.w. (275v. peak), five off in series, mounted on 1/16 inch thick bakelite strip—insulate from chassis.

C27 and C28—100 μF. 25 v.w. electrolytics (insulated).

C29—500 μF. 25 v.w. electrolytic (can insulated).

C30*—200 μF. 200 v.w. (same as C22)—operates OK on 215 volts.

C31 and C32—0.01 μF. Hi-K disc ceramic condensers.

R1—Nine 680 ohm, 1 watt, carbon resistors in parallel.

R2-R5—10 ohm, 1 watt, carbon resistors—four off.

R6-R9—47 ohm, ½ watt, carbon resistors—four off.

R11-R14—47 ohm, ½ watt, carbon resistors with 10-turn coil of 24 s.w.g. wire wound on each (PC1-PC4).

R15—50 ohms, 10 watt, wire wound I.R.C. resistor.

R16-R27—1 megohm, ½ watt, carbon resistors—12 off, one across each silicon rectifier.

R28-R32—100K, 1 watt, carbon resistors—five off, one across each 200 μF. condenser.

R33—5,000 ohms, 20 watts, wire wound, with slider to adjust current to give 7 or 8 volts across R35 (adjust only when "off").

R34—5,000 ohms, wire wound, potentiometer (bias control).

R35—200 ohms, wire wound, resistor.

SW1—11-position Paton industrial switch.

SW2, SW3—D.p.s.t. switches (large switches with plenty of contact travel and rapid action), ex disposals.

M1—0-500 mA. moving coil meter.

RFC1, RFC3—2.5 millihenry 4-pi r.f. chokes.

V1-V4—EL38s or 6CN8s.

V5-V6—VR105/30s.

RFC2—Special r.f. choke wound on 5 inches of ¾ inch diameter bakelited paper tube, as shown in Fig. 4, using 32 s.w.g. Lumex tough enamelled copper wire. Total length of winding just over 4 inches. This choke displays a small resonance around 10 Mc. and is quite satisfactory for 1.8 Mc.

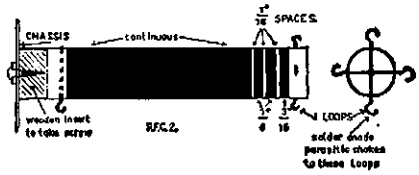


Fig. 4.—Special R.F. Choke.

L1—8 turns 1 in. long, 1¼ in. diam., tapped 5 turns, 0.8 μH.; 6½ turns, 1.2 μH.; full coil 1.6 μH. (16 s.w.g. wire).

L2—19 turns, 1¼ in. diam. x 2⅜ in. long, 8t./inch; tapped at 8 turns, 1.6 μH.; full coil, 4.8 μH. (18 s.w.g. wire).

L3—38 turns 1½ in. diam., 2⅜ in. long, 16t/inch 20 s.w.g. wire; tapped 6 turns, 2 μH.; full coil, 25 μH.

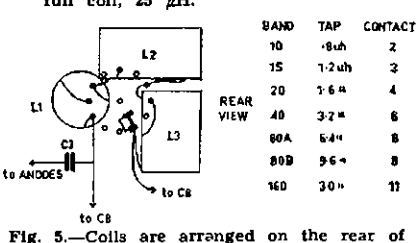


Fig. 5.—Coils are arranged on the rear of 11-position switch as shown.

These coils are space-wound and cemented to three polystyrene strips. Coils are arranged on the rear of the 11-position switch as shown in Fig. 5.

* Note.—Most electrolytics of this size and voltage need to be "conditioned" before use by leaving each unit on a supply equal to the peak voltage rating, with 10K resistor in series. The voltage on the condenser will gradually rise and stabilise at less than ½ milliamp. leakage current—if not, suspect it and use another condenser.

The driving power required from the exciter is $15v.^2 \div (2 \times 75\Omega)$, i.e. 2 watts, and thus has made it possible to reduce the level of signal right through the exciter, resulting, according to reports, in a much cleaner signal. See that r.f. is piped in 70 ohm co-axial cable, with the usual s.w.r. bridge in the output circuit.

Loading and tuning the amplifier is carried out by speaking and observing the peaks on the oscilloscope monitor. The output controls are quite broad and non critical. The loading condenser and inductance are preset according to band, the netting switch operated, transmitter brought to zero beat, and then the final tuned to peak the rumbly noise from the exciter (even though the audio is shorted). Both exciter and linear (separately) are tuned on a dummy load made of twenty 1,500 ohm 5 watt carbon resistors with a germanium diode r.f. voltmeter attached.

The other versions of this amplifier using 807s and similar tubes need slightly more grid bias than the EL38s but even at 25 volts bias, the drive requirement for a 75 ohm grid resistor is less than 10 watts.

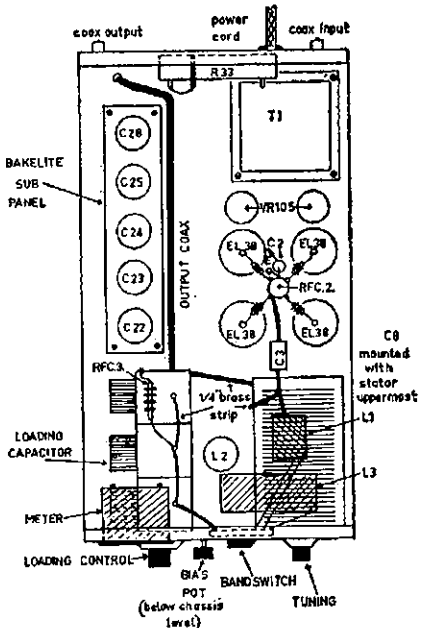


Fig. 3.—Above Chassis Layout of Passive-Grid Linear Amplifier.

Some experiment with screen voltages and grid bias voltages will soon arrive at a satisfactory operating condition. If your amplifier appears to need too much bias (and drive) try a lower screen voltage. 807s with 250v. on G2 require about 20 to 25 volts of bias, and appear to work very well indeed, but the EL38s have higher slope and shorter grid base, and are therefore easier to drive.

Any exciter using a 2E26, 807, 6146 or similar small transmitting tube will supply this with ease.

The exciter may be operated plugged to the linear without having the amplifier switched on—a small point, but this is not advisable with a grounded grid linear.

Finally, the secret of correct operation of linear amplifiers is that the plate meter needle should wave gently in the breeze, not kick violently from a low quiescent figure to the maximum stop on the meter.

This linear amplifier operates in such a fashion, but has the capacity to supply the peaks demanded by an old "leather larynx". Demonstrations are often given on 80 metres in the evenings. Transformers of the 385 to 450 volt class at 200-250 mA. are readily obtainable on the surplus market and I'm sure you can rustle up enough large pentodes or tetrodes from the junk box, so give this one a try. Suitable tubes are 807s, ATS25s, EL38s, KT88s, 6CM5s, 6BQ6s, TT21s, or VT127s.

If you have spotted a certain surplus item with four 807s in it, you have the basis of a very cheap and effective linear amplifier. The genemotor compartment will take power supply components, but I should advise more ventilation holes be drilled in the top, bottom and sides of the case. It is considered, however, that the narrow front panel, using the layout described, is much more pleasing in a neat table-top station.

SERIES RESONANT BY-PASSING FOR V.H.F. APPLICATIONS*

STEVEN E. SUMMER, WA2KYF

A cardinal rule of v.h.f. construction is to connect by-pass capacitors with the shortest possible lead lengths, but, unlikely as it may seem at first, long leads and smaller values of capacitance may provide more effective by-passing than the 500 and 1,000 pF. units now commonly used.

At 50 Mc. and above, the lead inductance and internal inductance must be considered when selecting by-pass capacitors. In the v.h.f. region the leads can be used as the inductive elements in series resonant circuits. Such a circuit is a theoretically ideal by-pass, having close to zero impedance at a single frequency. Series resonant by-passing is impractical over a wide band, and on lower frequencies, but in single-band v.h.f. converters and transmitters it may be highly effective.

Table 1

Values of capacitance in pF. required for resonance at frequencies commonly encountered in Amateur band v.h.f. work, for leads of ¼", ½" and 1" in length.

Freq. Mc.	¼" Leads	½" Leads	1" Leads
48-50	800	400	200
72	390	180	91
96	220	100	56
144	100	47	25
220	39	20	10

In using ceramic disk or dog-bone capacitors of 1,000 pF. or less, the internal or plate inductance may be neglected. Similarly, the resistive losses need not be considered, since they have no effect on the resonant frequency. Table 1 gives lead lengths and capacitance for series resonance at frequencies commonly encountered in Amateur v.h.f. work. These values were derived mathematically, but they can be checked experimentally. Simply twist the leads together and check for resonance with a grid dip meter.[1]

How does this method compare with conventional by-passing? At 144 Mc. a ceramic disk capacitor of 1,000 pF. with ¼" leads has an impedance of 10 ohms. In comparison, a 25 pF. capacitor with 1" leads has close to zero impedance. If the load impedance is high, the first capacitor would be suffcient, but for applications such as screen or cathode by-passing it might cause trouble. Also worth consideration are the greater ease of soldering and the lower possibility of heat damage with longer leads.

Transistors are appearing more widely in v.h.f. construction all the time. Their low load impedance calls for a lower value of by-pass impedance than would be acceptable in tube circuitry. Series resonant by-passing offers many advantages over more conventional methods, and can be applied in most v.h.f. applications. ●

* Reprinted from "QST", May 1963.

[1] Information in Table 1 is for total lead length twice that given. That is, the middle column infers two ⅛ inch leads, or one ⅛ inch and one ¾ inch, etc. Values are approximate, and will depend on arrangement of leads. For example, a 10 pF. capacitor with 1 inch leads connected together and formed into a circular loop resonates at 220 Mc. The same leads running parallel about 3/16 inch apart resonate up around 275 Mc.

If the capacitor is to be installed at some point where it is accessible with a dipper coil, short the terminal being by-passed to ground with a screwdriver blade or some other low-inductance device, and check for resonance. Adjust the lead length (either side of the capacitor) for resonance at the middle of the desired frequency range. Another good check, particularly in screen by-passing of transmitter amplifier stages, is to set up your favourite system for checking neutralisation, and then trim the capacitor lead length until the best indication is observed.

Series resonance is rather broad, so precise adjustment may not be necessary. Of the various arrangements indicated for a given frequency in Table 1, the high capacitance and short lead combination is preferable as there will be less likelihood of unwanted coupling to other circuits. Example: For 144 Mc., a 100 pF. capacitor with ¼ inch leads would ordinarily be preferable to a 25 pF. with 1 inch leads.—Editor, "QST."

The Tri-Band Birdcage*

GEORGE COUSINS, VE1TG

AFTER moving from Ontario to the Annapolis Valley of Nova Scotia in November 1959, the first problem was to find a place to live, and the second was to get back on the air. With winter coming on, the antenna problem had to be solved in a hurry, so between the trees appeared a scandalous conglomeration of long-wires, doublets and other arrays, mostly for 20 metres.

Of course with my good friend VE1GA only four houses away across the field, it wasn't long before I was very conscious of the results he was getting with his three-element wide spaced beam. The difference was that he is a permanent resident while I am a transient, so a beam was considered a bit too much for me to invest in. A good compromise seemed to be the cubical quad, so work was begun, with the XYL's clothes pole in mind for a support.

Two quads were built during the winter, but didn't survive. Finally came spring, and with it a copy of "CQ," complete with an article on the G4ZU Bird Cage[1]. This looked so interesting I was sold on it before I was half way through the article. The birdcage was constructed from the article for 20 metres only and was duly propped up against the clothes line pole.

The bottom elements were 2½ feet off the ground, but having no tower this couldn't be helped, so the thing was tuned up where it stood. All the methods tried, failed to bring the s.w.r. down under about 2 : 1. Deciding that the elements must be too long, we tried all sorts of capacitor arrangements, to no avail, so a pi-network coil from a surplus transmitter was placed in series with the coax. and the s.w.r. came down very smoothly to 1.05 : 1.

The thing was pointed south and a tentative CQ sent forth on c.w. A PY7 came back immediately with a 5 8/9 9 report, so there was great rejoicing in the VE1TG shack. Considering the generally poor conditions on 20 at the time, this was considered to be pretty good.

The problem of rotating had to be solved. A hole was dug about 4 feet deep in the back yard and a piece of water pipe 6 feet long was inserted. The cage was placed on top of this, leaving the lower elements about 2 feet off the ground. It could be rotated with one finger, so a motor was considered unnecessary at this time.

TRI-BAND CAGE

After a tower was built, the cage was examined critically and immediately the thought came to mind; why not a tri-bander? So away we went, and this is the result.

• The G4ZU Bird Cage in a previous issue of "CQ" inspired VE1TG to create this three-band birdcage for 10, 15 and 20 metres.

Fig. 1 shows most of the construction details. The mast is a 20-foot section of 2" o.d. aluminium irrigation tubing with a very thin wall and very light weight. A piece of 2" x 2" clear pine is turned down and driven into the tubing, making a solid wood insert a little longer than the length of the pipe, and so creating much greater strength than either would possess alone.

The elements were cut from lengths of 65S-T aluminium tubing, using 1" o.d. for the 20 metre elements, and ¾" o.d. for the 15 and 10 metre elements. The 20 metre elements were 0.052 wall and the others were 0.035. By careful planning and checking to see what stock lengths are available, the elements can be cut with very little waste. Don't throw away any extra pieces; you may be making Gamma or T matches before you're through and they will come in handy. The phasing lines are made of No. 12 wire with solder lugs on the ends, which are then bolted to the elements. The aluminium should be cleaned before the lug is tightened into place. I also coated the whole joint with clear plastic which is available in most hardware stores. The lengths which I eventually ended up using are:

20 metres—
Elements 8' 8"
Phasing lines 17'

15 metres—
Elements 5' 8"
Phasing lines 11' 7"

10 metres—
Elements 4' 4"
Phasing lines 8' 8"

The phasing lines are only approximate lengths and should not be cut until the points mentioned later are understood. There are eight elements and four phasing lines required for each band.

Six mounting plates are required for the elements. They are cut from ⅝ or ¾ plywood, and should be primed and painted before mounting. The 20 metre plates are 1½' square, and the others are 1' square. Two inch diameter holes are cut in the centre of the plates so that they will fit tightly over the mast. The plates are eventually bolted to the mast using non-rusting hardware and angle shelf brackets. Remember the spacing requirements for each band. The best method is to mark out the spacing required between the top plates and then bolt them in place on the mast, remembering to keep them in line with each other so that the elements will also be in line when they are fitted. The mast can be laid across two boxes or saw-horses while this is being done. By placing the top elements near the top of the mast, there will be about two feet of mast left at the bottom for fastening to an extension shaft.

The elements are fastened to the plates at right angles to each other, using water pipe straps bolted to the plates. This is shown in Fig. 1. A brass wood screw is also run through the element into the wood to prevent the element from turning or slipping out.

Remember to fasten shorting strips of copper braid or other suitable material to the top elements. Select two adjacent elements for the driven element and short them together. Do the same for the parasitic element. Do not allow the shorting strips or the elements to touch the mast, and remember as you proceed with the other bands, to keep the same relationship between elements all the way down.

Not having much faith in a 9' length of tubing suspended from only one end, I extended the wooden insert out the top of the mast by a couple of feet and then ran guys from the top of this extension to the outer regions of the 20 metre top elements. These guys are nylon here, but in any case should be non-metallic and of a mat-

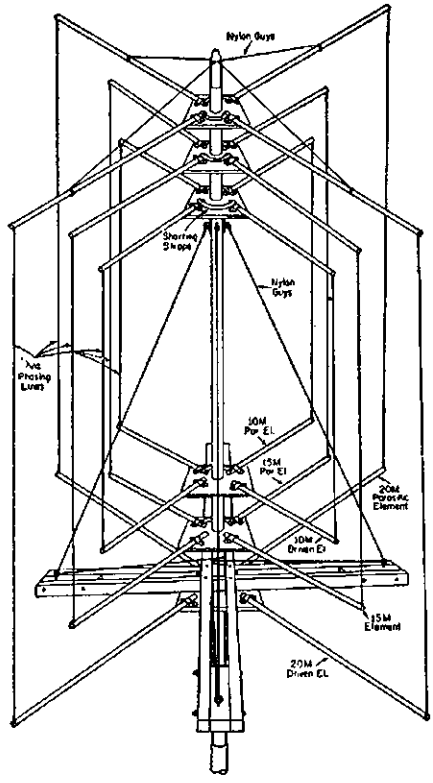


Fig. 1.—Basic structure of the Tri-Band Birdcage for 10, 15 and 20 metres. The overall height is 18 feet and the turning radius is 9 feet. All guys are non metallic (nylon or glass-line). The tuning devices are not shown in the drawing.

* Reprinted from "CQ," July 1963.

[1] Bird, D., "The G4ZU 'Bird Cage' Aerial," "CQ," April 1960, page 40; and "Amateur Radio," July 1960, page 10.

erial which is reasonably free from stretching or contracting when the weather changes. So far these guys have prevented any sag or bending in the elements.

Providing all has been done carefully, the top elements should be in place by now, and all lined up with each other. Now the phasing lines can be connected to the top elements and the bottom plates can be slipped on the mast. Install the bottom elements on the plates, but if you are going to tune it up on the ground don't bolt the bottom plates yet, as you will have to adjust the lengths of the phasing lines to bring the elements into the required resonance, and this will naturally mean having to move the position of the bottom plates. When this is all done, the plates should be bolted into place so that the phasing lines are stretched tightly between their appropriate elements.

If you intend to tune it up on top of the tower, cut the phasing lines for the lengths in the above table and bolt everything in place. This is what I did, so read on and see how it turned out for me; then make your own decision. An awful lot will depend on how easy it is to work on top of your tower or whatever you are going to stand the antenna upon. I found the tuning did not vary enough to worry about between ground level and 32 feet in the air. However, this will depend on location and surroundings, so should be left to the discretion of the builder. Everyone will have his own pet ideas but remember—be sure you can reach the 10 and 15 metre lower elements when you have it up there! If you can't, you had better do at least preliminary tuning on the ground, and take your chances on how it will work up there. Here again a lot will depend on the design of the tower and also on how long a reach you have.

RAISING THE ANTENNA

After spending many hours reading articles on antenna construction, I notice very little is ever said about how to get the things up in the air. In this case it depends on the design of the tower, height, and facilities available. When the antenna is completely assembled on the ground you will have something resembling an overgrown porcupine and just about as easy to grasp.

As soon as you decide to build the antenna (if you do) start cultivating friends—you'll need them for the great day. Also, if at all possible, I would suggest you try to tailor your tower to the needs of the antenna. Visualising lots of fun when the big day arrived, I built the tower with a 3-foot square top and with a platform about 4 feet down from the top. In this way, three men can work at the top with lots of safety. This is a good thing to point out to your friends when requesting volunteers for the raising. Even with this, there is a bit of fun in store when you get three men and an antenna all struggling away on top at the same time.

We raised the antenna all in one piece, completely assembled, by sheer manpower. Don't do it! We bent one element (one of the very top ones, of course) and also put a dent in the mast. Luckily both of these faults were remedied without too much trouble but they could have been a lot worse.

Further experimenting has proven that the easiest way to accomplish the task is one of the following:

Method 1: Mount a gin pole at the top of the tower, complete with a small block and tackle, and rig a rope sling around the mast in such a way that it can be raised vertically. The gin pole should be high enough so that the mast will clear the top of the tower and the base can be then swung into place.

Method 2: Release all the plywood plates except the top one. Slide them all up to the top of the mast in a tight group, and then proceed as before with the gin pole. The difference is that you now have about 18 feet of mast to grasp and also all your elements will be at one end—an important point when you're trying to keep an eye on all 24 of them at once!

Method 3: Remove the plates and elements as complete units. Stack them at the top of the tower in the correct order. Run the mast up through the inside of the tower and through the plates also. Bolt the top plate, slide the mast up, bolt the next plate, slide the mast up, etc., until the elements are all in place.

A combination of method 1 and 2 was tried out when we had to lower the antenna in order to straighten out the top element and it worked out fine. The gin pole also serves to support the antenna while you're taking a breather and getting your support problems straightened away. You'll need a rest by this time and something has to hold the thing up!

GUYING

Before tuning or anything else you must make sure the thing will stay up and I for one have little faith in a structure this high, standing there all by itself, in the winds we get around here. Guys there must be, but in such a way that they will not interfere with the rotation of the antenna. This can be quite a problem, in a closed loop system such as this.

The solution here, shown in Fig. 2, was to install two wooden booms at right angles on the mast itself, as low as possible, without interfering with rotation. Mine are mounted just on top of the lower 20 metre elements, and each boom is made up from two lengths of 2" x 2" x 14' lumber, with a piece of 2" x 2" x 3' at each end. The centre point of the boom is bolted through the mast and the ends are fitted with eye bolts.

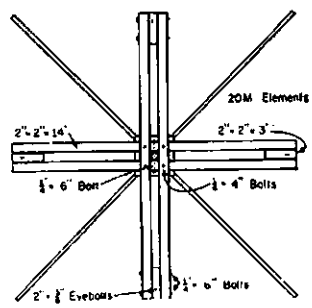


Fig. 2.—Guy boom assembly, top view.

The guys should be non-metallic. I used a new type of plastic clothes line with a tensile strength of 750 lbs. Each guy is fastened to the mast just below the top 10 metre element and is then taken out to the end of the boom where it is passed through the eye bolt and run back in to the mast at the bottom. It is tied here and by adjusting the tension on each of the guys, the mast can be held straight.

FEEDING

Separate coaxial cables are used to feed the three sections of the antenna. Though originally intended, I understand, to match 52 ohm, I decided to use the 72 ohm RG-59/U which I had on hand and had no difficulty in bringing the s.w.r. down. Possibly the Tri-Gamma match mentioned in W6SAI's Quad Handbook could be made to work here, but personally I prefer the separate cables.

When it comes time for tuning, if you don't have an s.w.r. bridge and a grid dip meter, beg, borrow or buy them. Also, enlist the aid of another Ham. It is necessary to have one man at the transmitter and one on top of the tower.

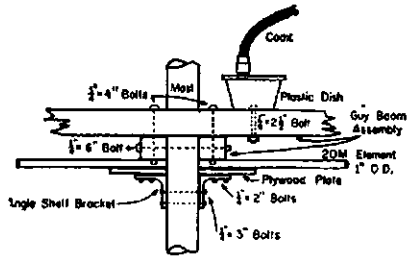


Fig. 3.—Details of the guy boom and twenty metre element mounting assemblies. The plastic box contains the gamma capacitor.

First decide whether you want a director or a reflector. The original article called for a reflector, but this has been changed now to a director. In any case get the grid dip meter to work and check the driven element. I found that, even though I had cut the chasing wires so that the total element was theoretically longer than the low end of each band called for, the measured frequency of resonance was considerably higher than the upper band limits. This may be due to the proximity of other wires for the other bands, but in any case is not too much to worry about.

Faced with this problem on the ground, the phasing lines can be lengthened to the extent necessary to bring the element into resonance at the correct point. However, I was on the top of the tower by the time I discovered this, so changing the lines was definitely "out". Instead, a small coil of about 6 turns of No. 12 wire 2" in diameter was made of B. & W. coil stock and inserted in the driven element. The coil was then carefully pruned while checking with the meter until the frequency of resonance was as required. I adjusted for resonance at the centre of the DX phone band in each case. However, as will be seen, the exact frequency of resonance is not too important.

(Continued on Page 11)

A Simple 160 Metre Antenna

HAROLD L. HEPBURN, VK3AFQ*

• It is the purpose of this article to describe the development of a portable (not mobile) vertical antenna for use in the 1.8, 3.5 and 7.0 Mc. Amateur bands.

SINCE the authorisation of the 1.80-1.86 Mc. allocation in 1963, its use, in VK3 at any rate, has been sporadic and mainly confined to Amateurs who have had sufficient real estate available to erect the conventional half wave dipole or at least a wire long enough to act as a reasonable radiator on the frequency. The average suburban block in the 55 x 150 ft. category does not lend itself to such arrays and it is perhaps for this reason that 160 metres has not enjoyed great popularity.

For local working (and in these days of low sunspot activity for DX as well) 160 metres is an excellent band. Only small inputs are required to the final to provide truly arm-chair local contacts on phone or S8-9 c.w. contacts up to 2-300 miles. Recent trials, carried out mainly by VK3YQ, have shown that the weekly VK3WI broadcast relays on 1.8270 Mc. have given a more reliable suburban coverage with 20 watts than the 80 metre 500 watt "rockcrusher".

More recently the need to provide additional command links for VK3 W.I.C.E.N. activities has emphasised the real need for an antenna which was both efficient and portable. Whilst it was in the light of this latter requirement that the antenna to be described was developed, its essential suitability as a permanent fixture for home use will, I hope, be ovious.

Basically this antenna is a centre loaded vertical whip with a fixed matching network at the base to enable it to be fed with 50 ohm co-axial cable. It is light (less than 15 lbs. in spite of its 25 ft. height) and can, quite literally, be put up with one hand. Furthermore, it is free standing and to date has been in the writer's back yard through quite severe wind storms without any signs of wanting to become a grounded horizontal!

Reference to any of the standard text books (A.R.R.L., R.S.G.B., etc.) shows that the total resistance of a coil loaded vertical antenna is composed of three main parts, the ground resistance R_G, the resistance of the coil R_C, and the radiation resistance R_R.

As it is only the radiation resistance R_R which is effective in transforming the input r.f. into a useable form, it is clear that any steps taken to reduce power losses in the ground resistance R_G or the coil resistance R_C will improve the performance of the antenna as a radiator.

These same text books stipulate that the loading coil should have a high Q and typical 160 metre centre loading coils are quoted which have around a hundred turns on a 2-3" diameter former. Besides the high ohmic resistance, such coils present a very real mechanical problem when inserted in the centre of even a 12 ft. whip.

The twin problems of small size and weight and high inductance with low resistance values can be met by ferrite toroids. Typically a suitable air cored inductance of say 130 micro-henries would consist of 80 turns of 14 gauge wire on a 3" diameter former, would be about 9" long and would weigh (together with its end cap and supports) some 3 to 4 lbs.

A toroid on the other hand can give this inductance with about 60 turns of 20 gauge wire in a space only 2" in diameter and about ½" deep. Besides the fact that the physical size has been very greatly reduced, the weight is only some 4-5 ounces and a quick calculation shows that the ohmic resistance has dropped by about 40%.

With these advantages in mind, a prototype antenna was constructed.

MECHANICAL CONSTRUCTION

The radiator proper consisted of a 14 ft. length of 1" o.d. 16 gauge aluminium tubing and a 12 ft., three section, copper clad steel tank whip, obtainable from disposals. Whilst aluminium tube is recommended if portable work is envisaged, there is no reason why ¾" galvanised waterpipe could not be used if a fixed home antenna is required.

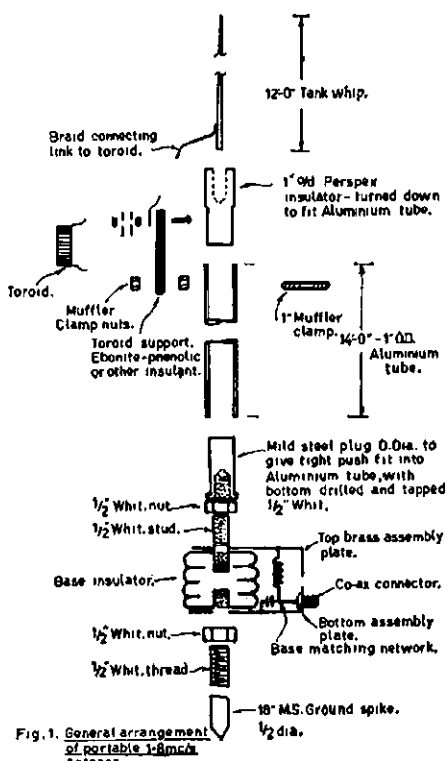


Fig. 1. General arrangement of portable 1·8mc/s Antenna.

The bottom 1" tube and the tank whip are separated electrically but joined mechanically by means of a centre insulator. In the case described this insulator was a 4" length of 1" o.d. perspex rod which was turned down for half its length to be a tight push fit into the aluminium tube and the other half drilled axially to accept the base of the tank whip. Reference to the exploded construction diagram (Fig. 1) will assist this and subsequent written explanation.

While perspex was used in this case, its use is not mandatory and any other insulating rod will do provided it does not absorb moisture, is mechanically strong and can be drilled and turned. Ebonite rod fits these requirements and is by far the cheapest of the alternatives offering.

The toroid (a Ducon yellow spot) provides the electrical continuity between the two halves of the whip and mechanically is mounted on a small piece of insulating material held in place by means of a car muffler clamp round the top of the aluminium tube. This muffler clamp also acts to hold the centre insulator in place if a fine saw cut is made for 1½" down one side of the aluminium tube. In addition the clamp provides electrical contact to the bottom half of the antenna. Electrical contact to the top half (the tank whip) is made via a short length of braid (taken from some scrap co-axial cable) which is soldered to the tank whip.

The base insulator is an S.E.C. throw-out. It is 3½" in diameter and 4" high. In each end is a metal plug which is tapped ½" Whitworth. To the top and bottom of this insulator are fitted two L shaped pieces of 16g. brass sheet which are 3" wide. The top brass piece is secured to the insulator by means of a short length of ½" Whitworth studding (a 3" x ½" bolt with the head cut off) and a ½" Whitworth hexagon nut. The length of the stud should be such that when the top plate is assembled into the insulator about 1" of the threaded stud remains above the top of the nut. This residual length screws into a mating tapped hole in a mild steel plug fitted to the bottom of the aluminium tube.

The bottom brass plate (the shorter arm of which is fitted with a co-axial socket) is fitted to the other end of the insulator by means of a nut and about 2" of thread cut on the end of 18" of ½" mild steel reinforcing rod. The other end of the rod is ground off to a point and the whole assembly is pushed into the ground so that it rests on the bottom plate. This unit is very strong and is quite adequate to withstand the swaying action of the 25 ft. unguyed whip.

The short arms of the L shaped brass plates extend some 3" beyond one side of the insulator and are made rigid by means of two short insulating pieces bolted between them. There is thus

* 4 Elizabeth Street, East Brighton, Vic.

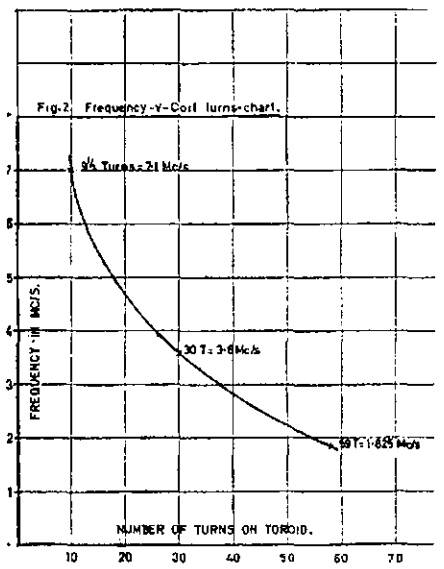
formed a protected space of about 3" cube which houses the base matching network.

The mechanical work having been satisfactorily completed, it remained to get the whip on to the required frequency.

RESONATING THE WHIP

The description which follows applies not only to the one case but to all similar cases. Within wide limits the method of resonating the whip and matching it to the transmission line given here can be used for whips of different lengths and on different frequencies. Only the figures quoted apply specifically to this antenna.

The first step was to make a small air spaced coil 1½" in diameter and about ½" long, containing (for 1825 kc.) four turns of 16 gauge wire. This coil was soldered across the brass base plates and acts as a coupling link to the g.d.o., used to measure the resonant frequency of the whip. Next the toroid was covered with insulating tape to prevent shorts between the wire and the core and then wound with some seventy turns of 20 gauge enamelled wire. This has to be done by hand and is a little tedious, but if winding is started from the centre of a 12 ft. length of wire the threading up process is a bit easier.



Make sure that the first and last turns are separated by about ¼"; if necessary, backwinding the last few turns to achieve this. Failure to leave this space on the first run led to a lot of heartache as the first and last turns welded together when r.f. from the transmitter was applied.

Having wound the toroid it was connected between the top and bottom antenna sections and a g.d.o. reading taken via the link across the base insulators. In order to establish the correct number of turns on the toroid for a variety of frequencies, five turns at a time were taken off and fresh g.d.o. readings taken. A plot of turns vs. frequency was obtained and is given in Fig. 2. From this graph the number of turns required to resonate at 1825 kc. was found and the toroid re-wound with this number on it. The number taken was exact and the antenna came up on 1825 kc. first off. This may have been luck, but at the very worst the addition or subtraction of one turn is all that should be necessary if care has been taken in drawing the graph.

So far so good. We now had a self standing antenna resonant on 1825 kc.

MATCHING TO FEED LINE

However one problem remained. That of getting it matched to the 50 ohm feed line. Reference to the literature indicated that (at 1825 kc. at any rate) the feed impedance would be low and probably in the 3-5 ohm region.

Some fancy work with an "Antennascope" gave readings of 75 ohms, too good to be true, and finally given the lie direct by trying to feed it with this impedance cable and getting a s.w.r. of well over 10. The reason for the nice null obtained at 75 ohms on 1825 kc. still remains obscure. Anyhow as it was not possible to get a direct measurement of feed impedance, matching was done on an experimental basis.

Firstly, the assumption was made that the antenna feed impedance was five ohms or lower at the design frequency. Reference was then made to an excellent article on vertical antenna and matching problems in the July 1961 issue of "CQ".

In this article the design procedures and calculations for "L" matching networks for short vertical antennae are set out and the approximate size of the capacitance and inductance required in the experimental matching network was determined from this information.

For the antenna under development the article indicated that an appropriate "L" network would require a shunt capacitance of 3,000 to 5,000 pF. and a series inductance of somewhere between 0.5 and 2 micro-henries.

Accordingly a very flexible experimental network was breadboarded. It consisted of a three-gang broadcast capacitor, a small roller inductance and a series of fixed mica capacitors of 1,000 pF. each which could be padded across the gang by means of crocodile clips. Fig. 3 gives the entire test set-up.

The matching procedure was as follows. The original base coupling link was removed and with no additional capacity across the gang and with the transmitter switched on (1825 kc., of course) the variable inductance was moved from zero to maximum, noting the effect of this change on the s.w.r. Then the gang was swung through from zero to maximum capacity and the effect on s.w.r. again noted. An additional 1,000 pF. was clipped across the gang and the process was repeated,

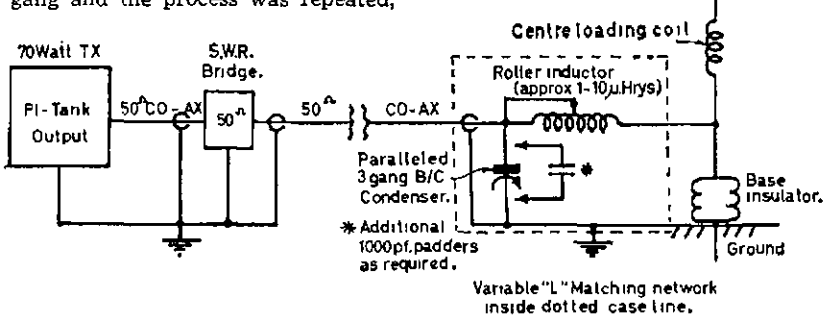
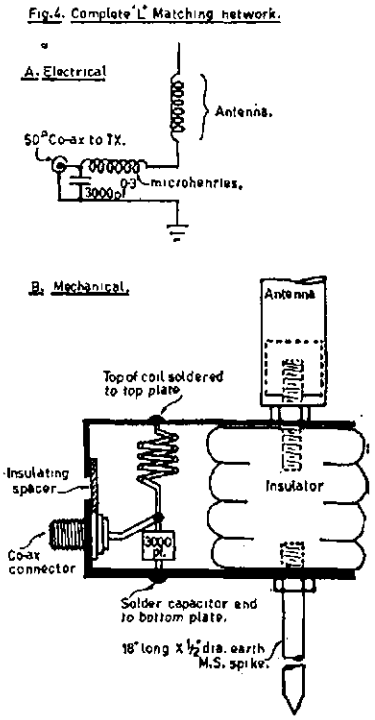


Fig. 3. Experimental base matching network.

Fig. 4. Complete 'L' Matching network.



once again noting the effect on s.w.r. A second and then a third 1,000 pF. capacitors were clipped across the gang and both capacity and inductance varied across their range. The transmitter was kept on resonance at all times.

For the 1825 kc. frequency the s.w.r. did not drop appreciably from a high value until some 2,000 pF. was in circuit (one 1,000 pF. fixed and the gang right in). The inductance did not appear to be very critical and a couple of turns either way did not vary the s.w.r. to any great extent.

Ultimately a position was found where the s.w.r. had been reduced practically to unity. At this stage the values of inductance and capacitance in circuit were measured (using the g.d.o. again) and one fixed capacitor and a small coil of the correct sizes soldered direct into the small "box" at the base of the antenna.

A quick trial with r.f. showed that the s.w.r. had remained the same as with the breadboard experimental hook up. The final values found at 1825 kc. for this antenna were 3,000

pF. and 0.3 micro-henries, the latter consisting of 4 turns of 16 gauge enamelled wire on a coil 1¼" diameter and 1¼" long. The coil was air spaced and the turns separated by using three strips of insulating tape. If you want to make a better job, mount the coil on a small strip of drilled polystyrene or phenolic board. Fig. 4 gives both the electrical, schematic and a diagram of the finished matching network at the base of the antenna.

Mention can well be made here of a feature of the s.w.r. bridge which proved most useful in these tests.

The bridge itself was a coiled coaxial one straight out of the A.R.R.L. Handbook, but the meter used was a surplus turn and bank indicator. These meters have two extremely sensitive movements and, by using one movement for forward power and one for reflected power, general relationship between them is visible at all times and one does not have to go through the bother of switching between the two to make a reading. The internal shunts had been removed from the meter and a dual 100,000 ohm carbon potentiometer used as a sensitivity control. The circuit is given in Fig. 5.

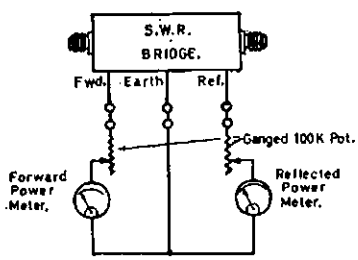


Fig.5. Dual S.W.R. Indicator.

RESULTS

On the air, results were most encouraging. For local contacts, i.e. up to 20 miles, there was no significant difference reported between the whip and a three-eighth wave end tuned wire used as a standard of comparison. Some stations reported a small drop in signal on the whip, some reported no measurable difference, and some reported a slight improvement using the whip. It can thus be stated with every confidence that the whip is as good as a long tuned wire for local contacts on 160 metres.

For longer hauls—up to 150 miles—the results were equally encouraging. Although the whip did not perform as well as the long wire, the average difference was only two S points. Where distant stations had set their S meter to 9 on the long wire, changing to the whip gave reports varying between S6 and S8. These comparisons were made on phone, so that the difference would be of considerably less consequence if c.w. had been used.

USE ON OTHER BANDS

By using a different number of turns on the toroid and different constants in the matching network, it is possible to use a vertical of the dimensions given on 3.5 and 7 Mc. since in both these cases the physical length is less than a quarter wave and needs inductive loading.

By following the method of tuning and matching given in this article, a well matched radiator on 1.8, 3.5 or 7 Mc. can be constructed.

USE OF GROUND RADIALS

Reference was made at the beginning of this article to the effect of the ground resistance R_g. In any vertical whip—no matter whether mobile or fixed—this ground resistance is large. The simple earth spike used in developing the antenna described was about the simplest (and thus the worst!) earth that could have been used. To overcome completely the effect of the ground resistance, the classical solution is to provide 32 quarter wave radials fanned out from the base of the antenna. On 1825 kc. this would mean 32 wires each about 130 ft. long, or just over ¾ mile of wire! The perfect solution is thus not a practical proposition. However, to do nothing about minimising the ground resistance is poor practice and a compromise solution was adopted.

Since the antenna was designed with portability in mind, six 30 ft. lengths of electrician's earthing wire were used to provide a better earth path. They were arranged in three sets of two wires. Each pair had a common connection to a battery charging clip which was snapped on to the lower brass plate of the antenna base and the two free ends each soldered to a 4" tent peg. The six wires were fanned out about 60 degrees and simply left lying on the ground, the tent pegs serving to locate the ends in the right spot. If you want to provide guys, each alternate tent peg can be used as a guy anchor.

The results quoted above were obtained without the use of the radials and comparative tests with and without them are still in progress.

Use of anything between no radials and the six recommended does not change either the tuning or the matching of the antenna—only its radiating efficiency. ●

THE TRI-BAND BIRDCAGE

(Continued from Page 7)

Having resonated the element, the coaxial cable was attached. The outside shield of the cable was attached to the exact centre of the small coil and the inner conductor was connected to a small gamma matching section. In the case of the 20 metre section, the gamma bar is about 30" long and the capacitor is a 75 pF. I feel these values will serve as a good general starting point, but would not necessarily always be correct. However, this is not different from any other type of antenna matching arrangement.

With an assistant on top of the tower to tune the capacitor, the s.w.r. was quickly brought down to 1.1 on 20 metres. Checking across the band revealed a total swing of from 1.05 at the lowest point to 1.2 at the highest point, with no difficulty.

The 15 metre section was tuned in the same manner, as far as the driven element was concerned. Again it was necessary to use a small coil in the element. This one was constructed from 6 turns of ¼" copper gas line, 2" i.d., and close spaced. Again it must be realised that the necessity for these coils may not arise and even if it does, the size required may not be the same as mentioned here. However, it is well to know how the problem was solved here, in order to save time in another installation.

The 10 metre element was found to require a small coil of tubing containing 3 turns 2" i.d. and the spacing adjusted until resonance was attained. Fig. 4 shows the gamma matches as they are here.

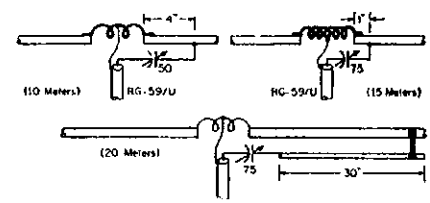


Fig. 4.—Specifications for the gamma matches for each band. The coils are wound on a 2 inch i.d. While the exact number of turns will vary with individual installations, as will the feed points, the measurements used will provide some idea for a starting point. 10 mx: 3 turns ¼ inch copper; 15 mx: 6 turns ¼ inch copper; 20 mx: 3 turns No. 12. The gamma bar for 20 metres is a ¾ inch tube.

The directors are tuned by the use of wire stubs on each element. In my case the 20 metre stub is 4½ feet long, the 15 metre one is 36 inches long, and the 10 metre one is 24 inches long. This will give a good starting dimension in each case. The final adjustment is done by any of the methods shown in antenna handbooks. I used the grid dip meter to set the directors for a frequency about 5% higher than the driven elements and then enlisted the aid of another Amateur who lives a few miles away. Using his receiver and S meter the stubs were then given a final adjustment. The eventual lengths are very close to those given above. ●

Modification to Command Receiver

E. C. MANIFOLD, VK3EM*

HAVING been interested in using the Command receiver for finding hidden transmitters for some years (3-6 Mc., BC454), it has been obvious that there is insufficient audio for mobile work.

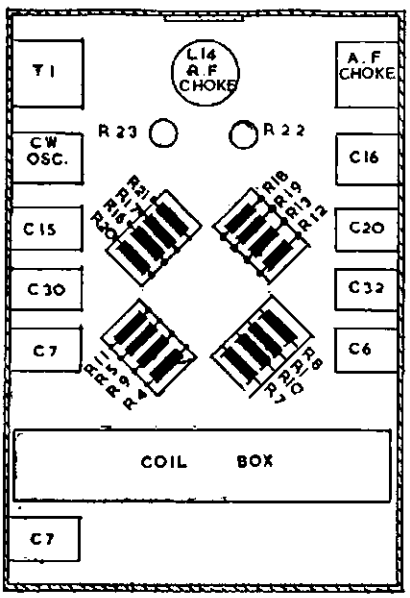
In an endeavour to overcome this, as a stop gap, the 1430 kc. i.f. was fed into the car receiver, and while this worked well enough, it was a bit hard on the car battery, with a mobile radiophone operating and no engine running.

EXTRA AUDIO

After looking at possible ways to improve things, and trying some of them, the present arrangement appears to be the most satisfactory, with a minimum of alteration to the receiver.

The original 12SR7 second detector, b.f.o. tube was removed, and a 12AH7 rewired into this socket for use as the first audio and b.f.o. tube, and an OA85 installed as the second detector, as shown in the circuit diagram, Fig. 1.

While a 12SL7 may have been a better choice for greater audio, there were several 12AH7s available, and have proved satisfactory.



Location of components beneath the chassis.

ADDING A.V.C.

It was thought that since a.v.c. is so easy to instal, this would be an advantage for phone operation, although not used when transmitter hunting, as c.w. is used for identification and bearings. But in mobile phone operation, it is necessary.

(Continued on opposite page)

* 267 Jasper Road, McKinnon, S.E.14, Vic.

C1—11 pF.
C2—15 pF.
C3—100 pF.
C4 (A to G)—Gang (147 pF.)
C5—3 µF.
C6—(A, B, C)—0.05/0.05/0.05 µF.
C7 (A, B, C)—0.05/0.05/0.05 µF.
C8—200 pF.
C9—40 pF.
C10—365 pF.
C11—3 pF.
C12—180 pF.
C13—17 pF.
C14—180 pF.
C15 (A, B, C)—0.05/0.05/0.05 µF.
C16 (A, B, C)—0.22/0.22/0.22 µF.
C17—180 pF.
C18—17 pF.
C19—180 pF.
C20 (A, B, C)—0.05/0.05/0.05 µF.
C21—17 pF.
C22—180 pF.
C23—180 pF.
C24—200 pF.
C25—0.001 µF.
C26—100 pF.
C27—180 pF.
C28—34 pF.
C29—0.006 µF.
C30—15 µF.
C31—0.001 µF.
C32—5 µF.
C33—Wiring Capacitance (under 2 pF.)
C35—750 pF.
C36—17 pF.
C37—17 pF.
C38—17 pF.
R1—620 ohms
R2—2 megohms
R3—51,000 ohms
R4—620 ohms
R5—150,000 ohms
R6—200,000 ohms
R7—200 ohms
R8—200 ohms
R9—620 ohms
R10—380,000 ohms
R11—100,000 ohms
R12—510 ohms
R13—200 ohms
R14—100,000 ohms
R15—5,100 ohms
R16—51,000 ohms
R17—51,000 ohms
R18—510,000 ohms
R19—100,000 ohms
R20—2 megohms
R21—1,500 ohms
R22—7,000 ohms
R23—7,000 ohms
L1—Antenna Input
L2, L3—RF Amp.
L4, L5—RF osc.
L6, L7—In 1st IF
L8, L9—In 2nd IF
L10, L11—In 3rd IF
L12, L13—CW Osc.
L14—RF Choke, 112 Microhenrys
L15—AF Choke, 3 Henrys
VT131—12SK7
VT132—12K8
VT133—12SR7
VT134—12A6

Schematic diagram of Command Receiver in its original form.

This was achieved by removing the 0.1 megohm grid resistor R11 on the second i.f. transformer, and fitting a 2 meg. resistor in its place, removing the earth wire from one end and connecting this point to the end of the diode load resistor R18.

From the opposite end of the 2 meg. resistor, run a wire to the front panel box, to connect to the a.v.c. off/b.f.o. on switch, under the tuning dial. This box will contain a.v.c./b.f.o. switch, 10K cathode bias gain control, and audio output pack—all miniature types as there is very little room.

R.F. STAGE BIAS

It was found that the bias resistor to the 12SK7 r.f. stage was 620 ohms and, when measured, the bias was 6 volts, at maximum gain position of the gain pot. Installing a 400 ohm resistor in its place reduced the bias to 3 volts with an increase of signal gain. Changing the i.f. valves bias resistors did not improve the gain enough to warrant the change over.

SPEAKER OPERATION

The original output transformer, while suitable for phone operation, has to be replaced for speaker operation, and a miniature speaker transformer was installed in its place in the rear of the chassis. This should match the 12A6 output valve, 7,500 ohms to voice coil impedance.

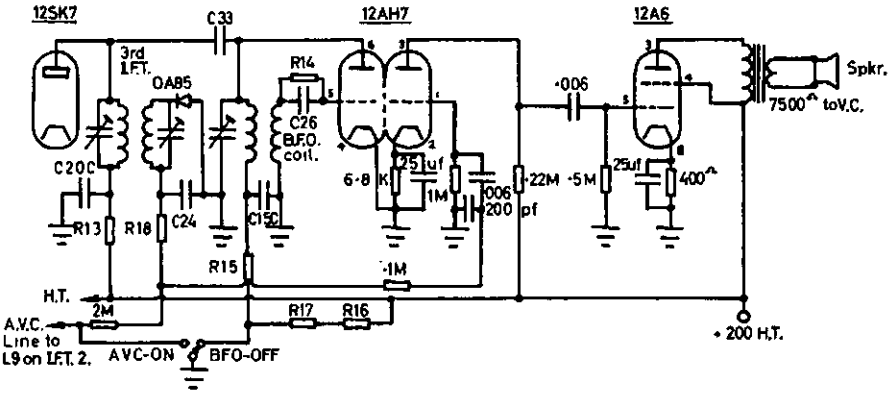


Fig.1. Modified "COMMAND" Receiver-detector & audio circuits.

With the greater audio gain, the motor generator whine became very noticable and an 8 µF. 600 p.v. electrolytic was installed across the h.t. line for extra ripple filtering.

It will be found that the original 12A6 grid resistor is 2 megohms. This should be replaced with a 0.5 megohm resistor and the cathode bias resistor of 1,500 ohms can be replaced with 400-500 ohms.

While this will give a higher than normal grid bias for the 12A6, sufficient audio will be available for mobile operation and, at the same time, will reduce the plate current and battery power drain.

These modifications could be made to other ranges of the Command receiver if desired for mobile operation.

IGNITION NOISE v. FREQUENCY*

IRWIN MATH, WA2NDM

Due to the increasing interest in mobile communications by Amateurs, it was felt that an investigation of the frequency distribution of the r.f. energy radiated from the ignition system of automobiles would prove useful both to the Amateur contemplating mobile operation and the Amateur already engaged in this phase of the hobby.

Tests were conducted between the frequencies of 2-150 Mc., thus encompassing the 80 through 2 metre bands. For those frequencies between 2 and 30 Mc., a Hallicrafters SX-100 was used and for frequencies above, a Civil Patrol 30-50 Mc. receiver; a 6 metre converter; and a 100-156 Mc. converter all using the SX-100 as a tunable i.f.

In order to have some sort of reference, a Measurements Corporation No. 80 signal generator was used and all noise measured with respect to a 10 m.v. signal at the respective frequency. All readings were taken by a peak voltmeter placed across the receiver's voice coil leads, and were converted to db. of noise readings vs. frequencies.

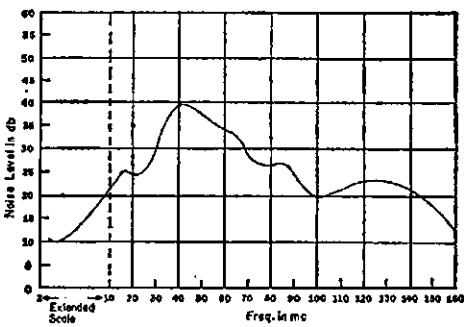


Fig. 1.—Graph showing results of study by the author of automobile ignition noise. Note peak between 30-45 Mc.

Antennae used were quarter wave whips above 30 Mc. and a 12 foot length of copper rod through a variable impedance matching device below 30 Mc. All antennae were placed where the whip antenna would normally be and vertically polarised. With horizontal polarisation of the pick-up antenna, results followed very closely but with somewhat lower noise amplitude.

The auto used was not equipped with ignition suppression devices. Unfortunately, one that was so equipped was not available and thus could not be tested.

The maximum value of ignition interference seemed to centre around 30-45 Mc. In fact at about 40 Mc. noise was about 30-40 db. above any other frequency examined. This would indicate why equipment such as six metre transceivers are so plagued with ignition interference. ●

* Reprinted from "CQ," August 1963.

Preliminary Announcement of 7th Jamboree-on-the-Air, 1964

The 7th Jamboree-on-the-Air is to start at 0001 hours G.M.T. on Saturday, 17th October, and will finish at 2359 hours G.M.T. on Sunday, 18th October, 1964.

Special stations proposing to be on include—

VE3WSB—World Scout Bureau, Ottawa, Canada.

GB3BPH—Baden-Powell House, in London.

K2BFW—Boy Scouts of America.

XE1ASM—Scouts de Mexico.

MERCURY AWARD

Object: To promote contacts with member stations of the Royal Naval Amateur Radio Society.

Classes: Class I. (U.K.), 20 points required.
Class II. (Europe), 10 points required.
Class III. (DX), 5 points required.

Scoring is as follows: QSOs with each member station counts as one point per band and stations can be contacted on more than one band, each QSO counts one point. Contacts with the Headquarters Station G3BZU count double (2) points per band. Contacts after 1st October, 1960.

A fee of 1/6 or six I.R.C's. (for foreign claims) will be made to cover costs. S.w.l.'s. are eligible to submit claims.

Claims, together with check list and QSL cards, plus fee, should be sent to R.N.A.R.S. Awards Manager (G3HZL), 153 Worple Road, Isleworth, Middlesex, England.

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub-Editor: A. H. BEHENNA, VK5BB,
36 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

A request for the condensing of DX Notes in "A.R." (as appeared in March issue) will mean the curtailing of trivial chatter, and only notes of actual workings, reception, and movements of importance can actually be included now in this column. All those who requested QTHs will be included where possible.

For those who do read these notes and take a genuine interest in them, would they please drop me a line to air their views on what they think should be included. The news placed herein is printed for these people, not for those who have no interest in it.

3.5 Mc.: Contacts on s.s.b. are possible, depending on static, and quite a deal of c.w. DX contacts are being partaken.

7 Mc.: Pile-ups on s.s.b. have to be heard to be believed between VK and G land. The efficiency of this mode of transmission is borne out by the mobile contacts. W contacts on 7.2 are there most evenings our time. Quite good signals from W, VE, KH, KW, KJ, etc. For those who have not listened previously, try 0730z 1030z daily. C.w. contacts go on regardless.

14 Mc.: All islands, etc., to the north are a pretty good bet nightly, while KL7 to KC4 can be had, provided a little patience is shown, this includes all modes of transmission. The average run of the mill contacts, viz. Malaysia through AP2, 1, to the continent are workable although the scarce ones are a little harder to obtain.

21 Mc.: Signals on this band, although not strong, are being effected greatly by QSB. Early mornings bring JA, DU, KR6 and some days about six or seven of the constant W stations. Most of these are a.m. transmissions, and are about strength 6-8 average, but they are workable. A few s.s.b. sigs, but most of these interested only in handling phone traffic. C.w. activity not very high here. Those interested should try 0000z-0200z, there is then a break of about three hours until the JA, DU, etc., stations break through again. This also depends on conditions, but on week-ends activity is naturally higher.

28 Mc.: Nothing heard here and no reports of activity whatsoever.

REQUESTED QTHs

EA3JE—Luis Parellada Roig, Puignovell 15, Tarrasa, Barna.
W6HYG—Albert De Young, 1011 Tam Oshanter Drive, Bakersfield, Cal.
FA2VD—Jean Navard, Palat, Tiaret, Oran.
G3MAN—D. Hornsey, 32 Shirley Rd., Rushden, Northants.
OA4CY—Julio Martinichin, P.O. Box 120, Calla, Callao.
DJ6MY—Manfred Schoberth, Ulmenstr. 13, 13a Nuernberg.
VE3CLH—H. Sharpe, R.R.4, Kingston, Ontario.
ZS1E—J. R. Pitts, C/o. P.O. Box 664, Cape Town, C.P.
3A2BY—Yvette Jaquenoud, 4 ru edes *Roses*, Monte Carlo.
4S7TX—W. A. Blain, C/o. Milk Board, Nahahenpita.
VP1SJC—Saint John's College, Landivar, Belize.
PY3BC—Romuld de Araujo, P.O. Box 82, Livramento, R.S.
OZ7VB—V. Blaugsted, Stenlandsvej 6, Copenhagen S.
KG6AHN—Jose P. San Nicolas, Yigo, Agana, Guam.
KP4AMP—Jose E. Polanco, P.O. Box 906, Cagaus.
KR6DO—Commanding Officer, 623rd A.C. & W. Sqdn., A.P.O. 235, San Francisco, Cal.
JA6AT—Yasumasa Arima, 3533 Nakana Yoshiri Shishhuku, Kogoshima, J.
JA3RB—M. Tsukamoto, 4-131 Tomei, Mikage, H. Nada, Kobe, Japan.
HS1B—A. L. Williams, P.O. Box 1038, Bangkok.
YA1BW—Via DL8AX.
CX5CE—H. L. Matturro, P.O. Box 37, Montevideo, Montevideo.
CR7GF—812 Lourenco, Marques Mozambique.
HS1I—P.O. Box 2008, Bangkok.
YA1AN—Via DL3AR.

RECENT DX WORKINGS

From Launce 5LD, all on c.w. 3.5 Mc.: W2FYT, W6OXJ, W6GTI, UA1KAG, UW9DA. 7 Mc.: LZ1KDZ, UAs, UBs, 2030-2100z. 14 Mc.: ZS5QU 1045z, EP2BP 1430z, YA1BW 1500z, W5HJ/KJ6 0730z, CR8AD 0830z, CE0ZI 0940z, VS1-6, UA, UM, UQ, OH, SP, SM, OZ, -DU, 0830-1330z.

From Ken 3TL, on 14 Mc.: XW8AW/BY, AP5HQ, CT1VB, FO8AQ, GI3OLJ, GM3XO, LU8DLK, MP4BQF, ZS6BL, UH8BO, all on c.w. XW8AW/BY, CR7GF, CX3AA, HC2JT, HS1I, KG6IF (Marcus), LU8FAO, PY4BEX, UO5PK, YA1AN, all on phone. Best QSLs received: CN8BB, EA3NI, HZ2AMS, MP4QBG, VP7BG.

From L5065 and L3138. 3.5 Mc.: HB1ZV, many ZLs and Ws. 7 Mc.: W4ZK, W6RW, W4MZJ, G5JZ, G8AB, G3PIT, 9M2DQ. 14 Mc.: XZ2KN, 9M2AE, KZ5, VK4JQ, XW8AL, VK-0PK, VR2, VR4, F, EA3JE, KW6, K5, KG6, G3, KX8, YV5, KP4, G8, KR6, ZS2MC, CX4-AAM, HL9KR, KC4, SM3, UA, KB6, OZ5BW, DL0STP, 9N1BG, CR8BB, GM2, GI3, DJ0, SP5AR, CR9AI, I1TMG, TI2BW, KL7, VE7, SM7. 21 Mc.: JA4ATF, UA6ND, DJ4YG, W6-YPZ, GM3PQG, KR6BF, VS4RS.

With these impressive lists we see that sigs are coming our way. Get with it. It can be yours.

This month I have tried to give an outline of all band habits for those who cannot hear their favourite country when they switch on the receiver. On 14 and 21 Mc. a directive array is a must these days for satisfactory QSOing. Special thanks again to the contributors of lists and thanks to those who wrote wishing me well in regard to the column.

73, Bert VK5BB.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6RU	2	297	VK2JZ	61	208
VK6MK	43	294	VK3ATN	26	204
VK3AHO	51	283	VK4HR	12	192
VK4FJ	21	270	VK4RW	23	186
Amendment:					
VK3TL	62	152	VK7LZ	36	136

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	320	VK2AGH	71	259
VK3CX	26	303	VK3ARX	66	238
VK2QL	5	301	VK3AHQ	79	235
VK4FJ	29	291	VK3XB	75	233
VK3NC	19	282	VK5RX	23	230
VK6RU	18	259	VK3RP	56	229
Amendments:					
VK7LZ	17	229	VK2APK	76	199
VK3RJ	42	217	VK3TL	78	165

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	8	304	VK3NC	77	283
VK2ACX	6	300	VK3HG	3	269
VK4FJ	32	299	VK3JA	43	252
VK2AGH	83	293	VK7LZ	23	242
VK6MK	74	292	VK4HR	7	233
VK3AHO	76	284	VK3BZ	4	231
Amendments:					
VK2VN	18	222	VK3TL	85	200
VK2APK	82	208			

S W L

Sub-Editor: Ian Woodman, WIA-L3006

The only news received from the various Divisions this month comes from VK2 and VK3, again nothing heard from the other areas.

VICTORIA

The Group is now having large attendances at all the functions arranged for the members. Remember the radio constructional evenings on the second Friday of the month and general meeting the last Friday of the month. During April the Group visited the Institute of Archaeology and the Volkswagen motor factory. For details of further visits, listen to VK3WI.

It has been reported that Graham L3118 may have his converter operating on 53 Mc. soon. Mac L3074 may be shifting to VK2. Robert L3076 looks like a beatle and Greg L3138 has had QSLs from KX6, KA2, VS6, VR1, OH5, ZE7, DU7, VR4, VE5 and GM3.

NEW SOUTH WALES

Oscar Project Co-ordinator, VK2HO, wishes to thank s.w.l's. who participated in Oscar II. project and reminds all s.w.l's. with gear capable of tuning 145.9 Mc. to be ready for Oscar III., possibly during July or August. Listen to your Sunday broadcast for details and you may be the proud possessor of an Oscar QSL card.

The monthly meeting is being well attended and even more members are wanted to join in the discussion which will assist you in your hobby. See you on the third Friday of each month. President Sid L2258 has supplied the circuit of a small simple and cheap b.f.o. which can be added to your existing set. A request for this circuit and/or the Aerial Book plus the stamp to cover postage will be available to all.

Thanks to the fellows who write and so assist me with these notes. Keith L2269 uses an 1155 rx and may be able to supply some DX soon. Sid L2258 has logged KW6, 9M2, DJ0, KC4, XW8, VS4 and BV1 between prawning and fishing whilst on holidays. Did he catch as many fish as stations? Don L2022 has offered me the loan of a book on S.w.l. Awards. I hope to let you know of them soon. Ross VK4/L2233 has logged ZL, W4 and LU9 and compiled 425 points in the N.F.D. Contest.

An impressive list of countries was received from Russell L2262. We all feel as you do re the lack of return QSL cards. Noel Black and George Barnes are newcomers to the column. Noel has an AR8, B28 and 1155 rx —good for some DX in future. George has obtained an AMR101 for his DX listening.

The Voice of the Andes beams to the South Pacific daily at 0130 to 0500 E.A.S.T. on the 25, 31 and 49 metre bands. 73, Chas L2211.

WESTERN AUSTRALIA

Peter Drew, the lone voice from VK6, reports he received many cards including FV0, YV5, EG7, GM3, HZ2, MP4, UG6, ZD7, KP4 and YO8. I hope your new r.f. pre-amp. brings in DX and that the night school still enables you time to listen.

DX LADDER

	Countries Conf.	Hrd.	Zns. Conf.	S.s.b. Conf.	Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	274	38	20	104	35
A. Westcott	93	159	31	9	107	11
M. Hilliard	84	285	33	34	168	12
P. Drew	94	237	30	44	200	27
M. Cox	80	232	31	49	163	21
C. Aberneathy	58	100	31	—	—	—
G. Earl	52	150	26	32	127	6
N. Harrison	44	119	29	4	20	35
I. Thomas	42	139	20	16	97	14
R. Oats	9	26	8	—	—	—

YOUTH RADIO CLUBS

And now the girls are getting into the act! Susan Brown (age 17), a prominent member for some time in Keith Howard's fine club at Booragul High, passed full A.O.C.P. recently—first school-girl to do so as far as I know. Sorry I have no details about Susan, but this event opens up other possibilities. There is every reason, in this modern world, for girls to have the same scientific training as boys. There is also the news that Phillip Lowe, of Epping High (Sydney), is the first of the non-clubbers to pass Limited A.O.C.P. (Phillip has a traineeship with Telephone and Electronic Industries.) This is an excellent effort without club help.

Y.R.C's. have had a bad blow from staff changes in High Schools—Keith Howard from Booragul to Cook's Hill, Lee Kinsella to Wollongong, Ralph Catchell from Homebush to Moorfield, and at least three others in VK2. Enthusiastic support from the Division and Amateurs generally would mean that this merely breeds extra Y.R.C's., but lack of this support means that these existing clubs may disappear and the transferred leaders have to build up again. Any rescuers for these clubs? Keith has started a non-school club near Booragul—can anyone beat the extraordinary donation of a 1950 Humber and rent-free premises to Keith's club?

We're still spreading. New Guinea will soon be with us. The Science Master at Port Moresby High School is an ex-VK2 teacher, Mr. W. Strang. The Headmaster is keen also and there is a good list of potential club members. Can any VK9 Amateurs assist?

We're fortunate in finding a live personality in VK4 to take over when Stan's ill-health made it necessary. He is Chas. Taylor, VK4UC (Uncle Charlie to the grateful kids of VK4), teaching at Clontarf Bay High, near Brisbane, and making the Redcliffe Peninsula and its schools a real Y.R.C. stronghold. With some help from Rotary (have you club leaders tried your organisations such as Rotary, Apex, Lions, etc.?), the Taylor drive and the goodwill of the De La Salle brothers, the Peninsula may have three Y.R.C. transmitting stations soon. Chas. shows great promise in the publicity field—more of that later.

We're also fortunate in VK3 (this is not the Southern Mouse!) where Ken Matchett keeps his organisation running well. His Newsletter No. 8 gives news and advice to leaders. John Ross (Country Fire Authority) has offered help at Warrnambool Radio Club, and Ray Ellis (3ZDE) at Gowrie Park. VK3 has five transmitting clubs—Australian Postal Institute (3ZTI), Morwell High (3ANL), 8th Footscray Boy Scouts (3AEF), Scotch College (3ZKY), and Gowrie Park State School (3AYM).

Prizes offered are: In VK3, most active tx from April 6 to Dec. 1; in VK2, Australian Radio & T.V. College Scholarship (based on our Inter. Certificate), pennant for most Elementaries in 1964, pennant from I.R.E.E. for most efficient club in 1964 (points for various certificates); for all VK, the big Morse Code Contest, held about September (probably by timed tapes) in two divisions (under and over 15, ages on date of competition) proceeding from individual club champions through state champion to VK champion. How are your brass-pounders training?

Have you seen your local M.H.R. to press for 1/10 of 1 per cent. of Sir Robert's £5½ million as a cheap way of doing a great deal of good for Science in schools through Y.R.C's? 73, Ken 1KM.

NEW CALL SIGNS

JANUARY, 1964

VK2OZ—E. C. Hulme, 2 Alroy St., Bulli.
VK2QM—E. W. Bastow, 33 Essilia St., Collaroy Plateau.
VK2TR—R. A. Taylor, 36 Auckland St., Bega.
VK2ZM—N. M. Nicholson, 36 Carnegie St., Auburn.
VK2ADV—C. M. Hicks, Steven St., Forster.
VK2AQU—F. Avent, Presbyterian Manse, 18 Payten St., Ryde.
VK2AXN—K. P. Karkkainen, 14 Foord Ave., Hurlstone Park.
VK2AXO—Woronora Radio Club, C/o. Post Office, Sutherland.
VK2AXS—M. C. Swinton (Mrs.), Station: Oil Bore Rd., Kulnura; Postal: P.O. Box 1.
VK2AZE—G. R. Stewart, 212 Prince Charles Pde., Kurnell.
VK2ZES—H. E. Stephens, Sibley St., Nimbin.
VK3EO—G. Edsall, 3 Ruthven St., Macleod West.
VK3ZX—H. M. Everett, 29 Sunnyside Ave., Horsham.
VK3AJC—J. R. Edwards, Lot 197, Golconda Ave., Frankston.
VK3ZAZ—I. J. Zmood, 1 Wrixon Ave., East Brighton.
VK3ZAX—W. L. Day, 103 Commercial St., Kaniva.
VK3ZCL—J. J. Chistensen ,19 Beckett St., Chadstone.
VK3ZEJ—R. E. Jordan, 36 Gale St., North Aspendale.
VK3ZHG—G. R. Hovey, 132 Loch St., Maryborough.
VK3ZLA/T—L. J. Kelly, 26 Cambridge St., Belmont, Geelong.
VK3ZRV—J. C. Weir, 57 Wilford Rd., East Ivanhoe.
VK4CA—A. W. Carter, 101 Francis St., Townsville.
VK4JI—J. S. Beckingham, 33 McLean St., Goondiwindi.
VK4QD—J. H. Garrett, Station: 31 Kurilpa St., West End, Brisbane; Postal: C/o. C. I. Patterson, 384 Figtree Pocket Rd., Figtree Pocket, Brisbane.
VK4QS—V. B. Aldrich, The River House, Lamington St., New Farm, Brisbane.
VK4ZES—J. E. Spencer, Ann St., Woombye.
VK4ZLI—J. T. F. Linde, 47 MacAllister St., Park Avenue, Rockhampton.
VK5SE—J. L. Schuler, 52 Finnis St., North Adelaide.
VK5ZDJ—C. Winkler, 4 Regent St., North Glenelg.
VK5ZKV—W. Blackburn, 78 Allinga Ave., Glenunga.
VK6ZEC—D. F. J. Benck, 46 Green Ave., Tuart Hill.

☆

CONGRATULATIONS

Hearty congratulations are extended to Geoff Morris (WIA-L3017), who, although blind, recently succeeded in gaining his Bachelor of Laws (Ll.B.) degree. Geoff has always been a keen S.w.l. and hopes some day to gain a licence to allow him to operate fully on the air.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

SIX METRES AND ROSS HULL CONTEST

Editor "A.R.," Dear Sir,

One could quite conceivably have been excused from taking a second look at the cover of "A.R." for April to make sure it was "A.R." and not the old English magazine "Punch" or similar upon commencing to read "How to Win a Contest" by Adrian Rofe (VK2HE). At £13 for a page in "A.R." Dr. Rofe has done his best to leave a literary impression. The greatest risk I find in commenting on the article, and the letter by the same author in the previous issue, is that I might become too personal. I shall try not to be.

Dr. Rofe believes "the spectator knows far more about the game than the players." This is a common erroneous idea—prove it by listening to the comments and heckling from the boundary given to football umpires by all and sundry—the game would surely be "improved" if the man in control heeded all the advice and abuse hurled at him. This same attitude of the bystander knowing better is further exemplified in cricket—look at the advice cricket umpires receive from English newspaper writers and critics. So we may go on ad infinitum . . . No Sir, generally speaking, those who participate in activities of any sort, and have the right frame of mind, are those most likely to succeed, whatever the field involved.

If I may be permitted the temerity to offer any advice I would say this. DX openings on 6 metres, as most know, have to be heard to be believed. When signals of even a few watts can be heard from a 1,000 miles or more at S9, and a band is open to all States as it was on Boxing Day, it is inevitable QRM will follow. In more than 25 years of listening it would be rare for the h.f. bands to ever approach 6 metres for quantity of massively strong signals at this QTH, which is a first rate short wave reception area. Notwithstanding, the h.f. bands can have their share of QRM—one only needs to listen to the 40 metre W section late in the afternoon to hear QRM.

Band conditions 10 years ago on 6 metres were a vastly different thing from today. There are many more signals, more powerful transmitters, large beam antennae, etc., but unless one has a receiver in keeping with the changed conditions, all manner of troubles will manifest themselves on a crowded band. The cross modulation and front-end overload characteristics of a receiver are of vital importance today. I have a converter of 1950 vintage, which has performed well in the past, but will not live with the new converter I made last year—could this be some of the trouble at VK2HE? Some time spent on the above two characteristics alone by anyone is time well spent.

To say only 300 kc. of the band is used is not entirely correct. Many of my own contacts this year were made by tuning from the 51 Mc. end down, and my transmitting frequency for much of the time was 50.42, and quite a few contacts were made when operating around 50.85. One has to be fair, however, and agree that crowding was certainly evident on the low end, where probably 60 to 70 per cent. of signals were operating, 20 per cent. in the next 200 kc. and the remainder above. Nevertheless, I must say very little difficulty was met here trying to work anyone selected at any time. I also cannot agree on the statement that names were not bothered about or given incorrectly. I was amazed how readily 99 per cent. of the 500 odd DX contacts made this year answered me by name when contact was made a second or subsequent time. This to me is one of the fine things about Amateur Radio—to be greeted with your Christian name from the other end, and I found this state of affairs almost without exception.

There seems little else of value to comment upon in either the letter or the article. Obviously the good Doctor is dangling bait on a line in the hope of catching something or someone. However, it is so easy for anyone to offer criticism but what makes a person stand out from others is to offer criticism constructively. I do say improvements could be made to the Ross Hull Contest, and suggest the following could be given consideration by those in authority.

1. In an effort to keep v.h.f. activity at a peak for as long as possible, the contest be continued for the month as at present.
2. Competitors be required to return their full operating log, but to indicate thereon their best seven days of scoring. A summary of the seven daily totals attached to the completed sheets would aid the Contest Committee. By the best seven days method:
   (a) Those having a shorter period than one month in which to operate could enter and have a reasonable chance of getting somewhere if they wished to really try.
   (b) Allow a competitor to enjoy Xmas with the rest of the family and not seriously affect his log. (This overcomes one of Dr. Rofe's objections.) It would also allow the competitor to break away and join in other family and community activities, and to take that "long needed bath!"
3. Intrastate contacts under 50 miles not to be permitted for scoring purposes—this would alleviate to some extent some local QRM and help the Interstate fellow.
4. State awards as well as individual awards to be created and so try to obtain a greater percentage of logs returned to the Committee—this in turn will keep band activity high—and that's the surest way I know to help keep our already small allocations intact longer.

Summarising the whole issue, (i) Dr. Rofe could have done better spending as much time on constructive criticism. (ii) Some time spent on adjustment to receiving equipment appears justified. (iii) It is as well to also adjust oneself to the different conditions prevailing on v.h.f. bands during a DX opening as compared to h.f. bands. (iv) An open tolerant attitude to all and sundry can be a blessing when the going starts to become rough. (v) Experience is a great teacher, and some time spent on DX openings prior to the contest, conditions one on what to expect, and one is better able to cope with difficult situations should they arise. (vi) More general use of the v.h.f. bands by ALL Amateurs would do much to spread knowledge and thereby tend to make us all just that little better—some Amateurs have never heard of a QQE03/20 !

Finally, Dr. Rofe, I did quite enjoy reading your satire, which I expect it was really meant to be. I do only hope it was written in the right frame of mind and not with malice of forethought. See you on 6 metres next DX season.

—E. C. Jamieson, VK5ZEJ.

AWARDS FOR S.W.L's.

Editor "A.R.," Dear Sir,

In March "A.R." I read with interest of the new V.h.f. Award, H.A.S., and as I have the necessary requirements I thought this may be available to s.w.l's. I wrote to the Awards Manager, who in reply said, I quote: "Sorry, there is no provision for this in the rules."

Can anyone tell me why s.w.l's. are not catered for in the awards issued by the W.I.A.? On checking the latest Call Book I find some 326 listeners listed plus those whose names do not appear, make quite a good contribution towards the W.I.A., and I feel that associate members should not be by-passed, but considered when the award rules are being made.

May I repeat what I wrote in "A.R." (April 1963), New Zealand has made it possible, so why not give a thought to S.w.l. Awards in Australia.

—Chas. Aberneathy, WIA-L2211.

VHF

Sub-Editor: Len Poynter, VK3ZGP.

Once again these notes are somewhat sketchy due to non arrival of Interstate notes. However I hope my pleas will not fall on deaf ears. The move on 6 mx has now been made and Channel 0 has made its appearance with test transmissions. It is of course putting in a paralytic signal at this QTH. Hope all States will be able to hear our king size beacon when the band is open.

The VK3 net frequency on 53.032 Mc. is gaining new adherents each week. Some 40 odd calls have been heard in and around Melbourne. Equipment ranges from 2w. Reporter units, both fixed and mobile, up to 150 watters. Vertical polarisation is in, with coaxials and ground planes appearing amongst the beams.

On 52.525 Mc. the f.m. net is building slowly with some six stations having been heard. Quite a few are planning n.b.f.m. transmitters in the hope that it might help. I believe that the VK2 V.h.f. Group sponsored a special newsletter on f.m. for v.h.f. and would appreciate if someone from that Division would forward me a copy for our information.

If you go mobile in VK3 on 6 mx, remember the 53.032 Mc. frequency, 52.525 Mc. f.m. and 145.85 Mc. f.m. are in use here. We hope that other States might make use of these frequencies, particularly the 6 mx channels and perhaps be able to keep a close watch on the band by using them.

Two metre DX between VK5-VK3 and VK7-VK3 has been quite good during the past month with good openings on quite a number of days with good signals both ways.

With the VK3 Sunday broadcast through 3WI at 8 p.m. on 80 mx and 2 mx, news of VK3 v.h.f. activity should be audible in most States. Keep listening for items of interest.

Please keep your reports coming in before the 1st of each month and help fill up this space. 73, 3ZGP.

WESTERN AUSTRALIA

At the time these notes are being written the losing of the 50-52 Mc. band is only a matter of days away and unofficial plans are in hand for a "small" celebration during the last hours on 50 Mc. As regards activity on 52 Mc. in VK6, it appears that the main activity will be between 52 and 52.5 Mc. with the VK6 beacon on 52.006 Mc. It is proposed to set aside 52.2 Mc. for a common calling and mobile frequency and arrangements are to hand to obtain supplies of suitable crystals.

While on the subject of 6 metres, I would like to welcome back Wally 6AG to the v.h.f. bands and also to welcome newcomers Don 6ZEC, Roy 6ZBD and Graeme 6ZEZ.

I don't know whether anyone from other States reads these notes, but I would like to stake a claim on behalf of the VK6 boys for the first fox hunt on 432 Mc. (actual frequency was 435 Mc.). If anyone can refute this claim then all I can say is, congratulations to you. The hunt took place on 21st March and was run by Charles 6LK and Rod 6ZDS, using a 432 Mc. tx running about 15w. input. By de-tuning the transmitting balun, enough (?) radiation was emitted on 145 Mc. to allow those without 432 Mc. converters to participate. The roll-up was poorer than usual, with seven cars taking part, three on 435 Mc. and four on 145 Mc. However, it is interesting to note that the first two to find the fox were using 435 Mc. gear (probably due to the stronger signal on this band).

Several of the members have bought "new" cars recently, these include 6ZDO, 6ZBT and 6ZDW (I wonder why Doug. bought a panel van?). Also it is rumoured that Colin is thinking of buying a new 179 M. 73, 6ZDB.

TASMANIA

The 1964 Athol Johnson Memorial Contest was held over the week-end 29th Feb., 1st March, and was won by Kevin 7ZAH; runner-up was 7RL. This annual contest is to promote v.h.f. and u.h.f. activity; particularly portable and mobile, within VK7. This, the fifth contest, was the most successful to date, since the activity was spread over a greater area of the State than in previous years.

432 Mc.: This band has few takers in VK7 at the moment. The only contact reported so far was between 7RL and 7LZ, both in Launceston. No activity in the south so far, although gear is under construction.

144 Mc.: Activity is being maintained at a good level throughout the State. Quite a bit of DX has been worked from North and North-West Tasmania the past few months, although conditions have not been as good as previous years. Best openings so far have been on 13th Jan., 28th Feb., and 27th and 28th March. Unfortunately no DX has been worked from Southern VK7 this year, although an inversion was noted in Hobart from 26th to 28th Feb. During this time GTV9 and HSV7 were received at viewable levels by 7ZAP at the elevated Hobart suburb of Mt. Nelson—but no 2 mx DX.

50 Mc.: Nothing of note to report on. No doubt everyone is preparing to move to 52 Mc. 73, 7ZAQ.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

FO8AQ requests that all QSLs be sent to him direct and **not** to FO8AA.

We regret to learn of the tragic loss sustained by Bud Shultz, W6CG, well known to VK c.w. and r.t.t.y. stations, when on March 18 his wife Mary was killed in an auto accident. The circumstances are even more distressing. Mrs. Shultz was driving along a freeway when a get-away car driven by hold-up men hotly pursued by police and travelling at high speed ran into the rear of her vehicle. Bud learned of his loss in the course of his duty at the local b.c. station when compiling a news bulletin. We mourn with you, Bud.

Rules for the annual SP International DX Contest arrived too late for prior publication. The Contest was held on 11th and 12th April. Rules were similar to previous years and logs are due by 31st May. Full details from this Bureau.

Rules for the 1964 P.A.C.C. Contest staged by the Netherlands section of the I.A.R.U. also arrived too late for prior publication. This Contest was held from April 25 to April 26. Logs must be postmarked not later than June 15. Further details from this Bureau.

After seven years as VK2 Inwards QSL Manager, Frank Hine (VK2QL) has surrendered the appointment due to a restrictive indisposition. We trust the ailment will yield to the more intensive treatment that Frank will now be able to undergo. His successor is VK2SG.

In the E.D.R. 13th OZ-C.C.A. Contest Amateurs will try to work Amateur Stations in all continents. The following Amateur bands may be used in both c.w. and phone: 3.5, 7, 14, 21 and 28 Mc. Dates—C.w.: 1200 G.M.T., Saturday, May 2, to 2400 G.M.T., Sunday, May 3. Phone: 1200 G.M.T., Saturday, May 16, to 2400 G.M.T., Sunday, May 17. C.w. contestants will exchange six-figure numbers consisting of an RST report plus the number of QSO starting with 001. Phone contestants will exchange five-figure numbers consisting of RS report plus the QSO number. Three points for each QSO. OX, OY and OZ contacts count 8 points. Every country worked counts as a multiplier, and the final multiplier is the sum of all countries worked on each band. Each of the W/K, VE, PY, LU, VK and ZL licensing areas count as separate countries. Final score: Contestants multiply the total QSO points by the sum of multipliers. Logs are to be sent to E.D.R. Contest Committee, P.O. Box 335, Aalborg, Denmark, with usual certificate to be mailed by June 15, 1964. Suitable certificates will be awarded for c.w. and phone to the Amateurs attaining the highest score in each country.

—Ray Jones, VK3RJ, Manager.

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FEDERAL AWARDS

The following awards have been made since 6th February, 1964:—

W.I.A. 50 Mc. W.A.S.:

Call	Cert. No.	Addt. Cntrs.
VK6ZCM	53	–
VK3ZIG	54	1
VK4ZK	55	3
VK4ZEK	56	1
VK1VP	57	2
VK4ZAL	58	2
VK8ZCX	59	–
VK6ZDS	60	1
VK5KK	61	3
VK6ZAS	62	–
VK5ZGF	63	3
VK5WV	64	1
VK6BE	65	1
Correction:		
VK4ZLG	49	2

V.H.F.C.C.:

VK5KK	28	50 Mc.

W.A.V.K.C.A.:

VR1G	253
UA0EH	254
W0AUB	255

—A. Kissick, VK3KB, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

The main cause for jubilation this month is the success of three candidates who sat for the January A.O.C.P. exam. Two, Susan Brown and Jan Oosterveen, passed for the full ticket while Ross Beckley passed for the Limited. In passing the exam., Susan, who is 17 and a pupil of Booragul High School, becomes the first schoolgirl in Australia to qualify for the A.O.C.P. Susan says she will be unable to devote much time to Amateur Radio this year since her final examinations are in November, but she does hope to get on the air sometimes and is especially interested in c.w. contacts. Jan, who has just completed three years at the same school as Susan, is now a technician in training with the Post Office. By the generosity of some local Amateurs, he already has equipment ready in Sydney and at his home in Awaba to go on the air as soon as the coveted ticket arrives. Ross hopes to do his Morse test before the end of the year and complete the requirements for the full ticket.

Meantime those who were not so fortunate are saddling up again and really aim to get the examiners beaten this time. All the candidates are members of the Westlakes Radio Club, Teralba, where renovations are going on apace both in the classroom and the operating room and workshop. It is hoped that this club will extend further the activities of the Youth Radio Scheme in the Lakeside area and provide some more examination material in the future.

After a long career in the Post Office, Toronto's brass pounding postmaster, Jack 2KQ, has retired and was given a send off party during the month. Jack has been on the air quite frequently in recent weeks, on c.w., and has had some pretty good signal reports from Paddy 2AXU, who is all of 400 yards away. The old gentleman of Phenyle Bay, Bill 2ZL, and his little buddy Bob 2AQR have journeyed forth to distant places north, north-west and coastwise, paying visits to their many Amateur friends in these areas. Geoff 2VU is much more active of late and has been heard training the junior op.

Frank 2APO has found a 160 metre rx and now has no troubles whatever with the Monday night broadcast although he has caused some strife by overloading Gordon's rx at 2ZSG. The local boys got among the prizes at the recent conventions and Ian 2ZIF, Les 2RJ and Stan 2AYL all came home with happy smiling faces. Les was especially jubilant since he scored twice and Sylvia the XYL won the lucky number. Had there been a baby show then the new junior would undoubtedly taken that off as well.

Your scribe took himself off to Adelaide at Easter with the express intention of meeting Pansy, but the VK5 boys had hidden him away in a safe place. There is current rumour in the Cessnock district that that intrepid grid modulation man, Sherwood, has given Amateur Radio away in favour of photography. We can only hope that Chris and his merry men will put him back on the right track so that he may keep the promise to be on by 1970. The really consistent operators in the branch area are the 2 mx chaps who are keeping Newcastle on the v.h.f. map. Des also is still finding time to improve the 432 Mc. gear and go to work as well. Rumour has it that one of our executive officers is moving to the choicest DX spot in the country where there is only one other active Amateur, so keep your ears tuned for an even bigger signal than usual from this senior gentleman.

Since there was no meeting this month before the notes were prepared, a report of the April and May meetings will appear in the next issue. Because of illness, the lecturer set down for the April meeting, Les 2ZBJ, was unable to attend and his talk of "Receiver

Front Ends" has been postponed until the May meeting. This will take place in room 15, classroom block, Newcastle Technical College, Tighes Hill, at 8 p.m. on Friday, 1st May.

Negotiations are in progress with the College to have a bigger room allocated for meetings as the members have outgrown room 15 with only 40 chairs. Please listen for last minute changes to the room number on the Monday night broadcast. The broadcast is transmitted on 1820 and 3595 kc. and relayed on 144.4 Mc. by Gordon 2ZSG. The news originates from 2AWX, the official station, and call-backs following the session are welcomed. For those who don't know, it commences each Monday evening at 7 p.m. E.S.T.

In addition to the lecture at each meeting, there will be some other entertainment, but you'll have to be early, as they commence on the dot at 8. So try to make it, you are sure to enjoy yourself. 73, 2AKX.

CANBERRA EASTER CONVENTION

Over the Easter week-end, in beautiful sunny weather, the Canberra Radio Society organised a Convention with a difference. Since Canberra has so much to offer the tourist and has so many centres of great scientific interest, it was arranged that visitors could have Amateur Radio, tourism, and interesting visits in any proportion they wanted.

The travelling time on Friday was enlivened with a Mobile Contest (won by Vic 2VL). The club rooms were full of radio talk on Friday night. The delightful Cotter Dam area was the venue for a picnic lunch on Saturday, and there the tough Receiver Sensitivity Contest was held. Competitors were given a 5/5 signal to start with and the power was reduced after each code group of letters and numbers was given by voice. The winner was Bruce 3QC who received five correct groups out of ten. Any receiver and any antenna was allowed. Are there any brave contestants in 1965? (No tall yarns count!) A V.h.f. Hidden Tx Hunt (won by Phil 2ZPI) brought some back to the club rooms, but some prolonged their picnic in delightful surroundings. That night a dinner was held.

On Sunday morning, there was a most interesting visit to the Australian National University Nuclear Physics Dept., where Tony 1SG showed a fascinated group the Van der Graaf and the Tandem Accelerator. Tony works on these monsters and was so able in his exposition that 7,500,000 volts and its effects on a nucleus, not to mention a remarkable complex of machinery and instruments, seemed less of a mystery. Sunday afternoon was occupied with a V.h.f. Hidden Tx Hunt (won by John 2EZ), an All-Band Scramble (won by Frank 2ACQ) and a visit to Mt. Stromlo Observatory. That night, there was a social evening with prize-giving and a film on "Single Sideband". With prizes and free samples from McGraths, A.W.A., A.W.V., Ducon, I.R.C., Willis, Cunningham and A & R, everyone made a good profit.

On Monday morning there was a special visit to the Navy Tx at Belconnen. The problems of using **several hundred thousand watts** kept the questions flying. There was much interest in two-tone morse, teletype, frequency shift keying, banks of frequency synthesisers, hundreds of acres of buried radials, a large farm of rhombics, log-aperiodics, gigantic dipoles, and a final tank coil the size of which you wouldn't believe. We acquired a Naval addition to our code—ZFO (F for finger, O for out). A pleasant session in the Officers' Mess rounded off an eye-opening two hours.

This was the first Convention of its type in Canberra. The numbers were not large (about 40 attended, not including XYLs), but nevertheless the C.R.S. will provide in 1965 a programme even more extensive and feels confident of increased numbers. There will be h.f. and v.h.f. tx and fox hunts, mobile scrambles, the new rx sensitivity contest, at least one special event for single sidebanders, and visits to a selection from A.N.U. nuclear physics, Mt. Stromlo Observatory, Belconnen, and the new Mills Cross Radio Telescope which will probably be operational by then. All the attractions of Canberra are available, too, as well as the Snowy Mountains Scheme. With such attractions for Amateurs, combined with separate tourism for XYLs and harmonics, the Society feels confident it has a new type of Convention. C.R.S. may have a small block of many types of accommodation available up to a month before next Easter, but it does not have the finances or manpower to take too much responsibility—it strongly suggests early booking, preferably many months ahead. A copy of the 1964 Information Sheet and Programme will be sent on receipt of a stamp. If you want a programme like the one outlined, let the C.R.S. know of your support.

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VICTORIA

WESTERN ZONE

There is very little to report at your scribe's QTH this month. Owing to the long day summer and the high noise level coming from the a.c. mains, signals are weak on most of the bands, but still manage to have 8 or 7 regulars on 80 mx for the zone hook-up each Wednesday evening.

One or two of our members are toying with the idea of attending the State Convention during the next few weeks, so we are looking forward to hearing a first-hand report on same.

About the only members active on the bands are 3AFU on 160, 6 and 2, and 3NN seems to be working a few on 2 mx. 73, Bert 3EF.

QUEENSLAND

THE SUNSHINE STATE'S 1964 CONVENTION AT ALEXANDRA HEADLANDS

Cyclone Henrietta heading for the coast . . . 100 m.p.h. winds . . . devastation could be as great as . . . mountainous seas . . . heavy rain. What a forecast to have at the time the Convention was due to commence. Did it deter anyone? Not a chance—more than ever came to Alexandra Headlands to the best Convention yet. What of the weather? Two bad showers over the week-end.

This year's Convention differed from previous years in that the V.h.f. Group, who had been very active over Easter, in all the heavy rain, helping with the Boy Scouts' Easter venture, were not there in force with their usual hustle and bustle of cars and much activity with contests.

Instead there were more of the h.f. fraternity perhaps of a year or two older group who were content to go more quietly enjoying meeting old and new acquaintances. There seemed to be but time for four contest activities instead of the usual eight or ten. Perhaps Bob 4ZRC will have more assistance next year.

Of notable importance was the strong support from the Wide Bay and Burnett Branch who were lead by President Roy 4ZWR and Secretary Jocelyn 4JJ.

It is pleasing to note that the policy of encouraging members to bring their families is being appreciated as this year the space that had been made available for families was fully taxed so that next year when, so we are told, more members will be bringing their families, we will have to make another wing available. Where else can members with a family get such a low-priced pleasant week-end holiday?

Some dozen visitors arrived on Friday night and the aerial gang got into action soon after breakfast next morning, Saturday 4th, when two h.f. and a v.h.f. station were set up.

During the morning an all-band scramble, no holds barred, was held. After dinner the v.h.f. gang turned on a hidden tx hunt and the ladies arranged a visit to a potter's studio on Buderim Mt., where they spent a pleasant afternoon watching the potter demonstrating his art.

The Annual General Meeting was held at 4 p.m. when Pat 4KB gave a resume of the financial statement and his report of the past year's progress, which was received with acclamation. It was indeed a pleasure to have such a large proportion of country members at the meeting. Treasurer Keith 4DG and Lionel 4NS came up specially for the meeting.

Alf 4OL gave the 4WI Sunday morning news from the Convention at 0900 hours and was pleased to have about 20 call-backs. He gave such a glowing picture of the Convention that several members there and then set off for Alexandra Headlands.

Contest winners were as follows: All-Band Scramble (Sat.), Rod 2ACU; Hidden Tx Hunt, 1st Dane 4ZAX, 2nd Paul 9ZBV; All-Band Scramble (Sun.), Leigh 4RH; Most Distant Visitor, Paul 9ZBV; Best Home-Built Equipment, Ken Chiverton; Lucky Reg. Number, Paul 4VS, AR7 Rx; Raffle, AR7 Rx, Max 4HD; Lucky No., Ladies, Joan, XYL 4RZ, and Jean, XYL 2ALB, Shelly ware; also six children won prizes provided by Al 4LT. All radio contestants received a set of aligning tools in a pouch.

Exactly 100 registered, which was a good gain on last year and despite the reasonable charges we still made a gain financially, which augurs well for next year.

Thanks to our overworked organiser Bob 4ZRC, Jocelyn 4JJ and Marie, who were towers of strength in registering visitors and carrying out other tasks. Thanks also to our friends in Brisbane who helped with prizes and equipment which was really appreciated. See you there next year for sure. 73, 4PJ.

TOWSNVILLE AND DISTRICT

Gregg VR2BC (this morning 5/4/64) was quite perturbed, enquiring where Henretta the cyclone had disappeared to after the last one (Gertie) from Sunny North Queensland had played havoc in Fiji. Then the dulcet tones of Ray 9RH came on and reported that it had lashed Norfolk Island in the wee small hours of this morning. Everything was wet and his temporary antenna still working. So Gregg was quite happy that it was not going his way. Amateur Radio still keeps the boys informed just what is happening.

Activity seems to be picking up around here as a few extra trying to punch through the noise level. Allan 4PS hard at it getting

the 144 Mc. gear ready for the new satellite that promises great things in the way of DX on the v.h.f. bands, so it will be interesting to see just how things go. Merv 4ZMV shortly to arrive from the backblocks to our fair city on transfer. He should then be happy to try out all those wonderful and weird ideas that he has been dreaming up the last few years. So boys watch all those bits and pieces lying around, as he belongs to the emu totem that revels in this type of thing.

Basil 4ZW still hoping that Zoe will let him get that beaut receiver that is always being tried out in the shack. While Evie keeps Charlie 4BQ on his mettle in erecting antennae. Bert 4LB waiting arrival of choice part from Japan to improve the receiver. Vern 4LK made a welcome visit the other day; long time no see or hear. The boys from the Burdekin area seem to be hibernating for the winter very early as no r.f. from that direction after all those grand ideas of Claude's. Now that the Highway has by-passed my QTH, I miss those callers from the South. Why not make a detour, the kettle is always ready for a cuppa!

What has happened to the Capital City boys? No notes! Remember, the band is not always open on Sunday morning to copy the news. Where are all those scribes? 73, 4RW.

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TASMANIA

Well, another Annual General Meeting and Dinner have come and gone, and a successful "Do" it was, too. Our thanks go to the Northern Zone President (Denny 7DK) and his loyal band of helpers for a most enjoyable time. Forty odd members attended the meeting and 61 sat down to Dinner. The P.M.G's. Department was represented by Mr. W. Hollingsworth. There was a disappointing roll up from the N.W. Zone, but then no one night can suit everybody. Perhaps things will be better next year.

We had Brian 7ZBE (ex-VK0BE), complete with face fungus, with us for a few days after his return from Davis Base. He has now gone on to VK3 for some months before coming home again. Says he wants to go back for another term. Personally, I'd rather go north to the warmer climates.

Good news about our Athol Johnson Memorial Contest. It is at last on a State footing. Previous years it has been contested for only in the Southern Zone, but this year stations were active in all three zones and the perpetual trophy was won by Kevin 7ZAH; congratulations, Kevin. The battle will be on now to get it back down south.

Good to have a VK2 visitor in Albert 2ZFB among us at present and possibly for some time. Terry 7CT has started another A.O.C.P. course in the club rooms on Tuesday nights, and at present has eight starters.

The job of "Financial Wizard" has been filled by a "volunteer" in "Tiny" 7JD, the biggest man in the Division. I feel sure no one will argue with him when or if he pulls the purse strings tight.

VK5 is fortunate at present inasmuch as two of our Division's leading lights have been avisiting. Denny 7DK was over there on a fortnight's holiday, and Ted 7EJ represented us as Federal Councillor at the Easter Federal Convention.

Jack 7JB, who recently attended the Civil Defence Conference at Mt. Macedon, reports that there is a definite place for the Amateur operator in Civil Defence Communications, so it behoves us all to participate and make the Amateur Service mean "SERVICE".

Joe 7BJ is soon to hibernate for the winter at his mountain bachelor's quarters and we hope that another interesting lecture on "Trends in Receiver Design" to conclude his series will be forthcoming before the snow sets in. 73, 7ZAS.

NORTHERN ZONE

Last month the Annual General Meeting and Dinner were held in the North. I won't go into the details of the business of the meeting, office bearers, etc., as, no doubt, our new State Correspondent will go into that. It is sufficient to say that a good time was had by all.

Congratulations to Reg 7RL for obtaining second place in the recent intrastate 7AJ Memorial V.h.f. Contest.

There was a good 2 mx break-through during Easter and quite a few new VK3s were worked. Seven VK7s were heard on that night. 73, Leigh Pretty.

NORTH-WEST ZONE

Sorry no notes last month chaps, but they must have been delayed in the mail. The same fate may befall these, what with a late meeting and a P.O. strike. I am keeping my fingers crossed.

Main news last month was the highly successful Field Day held at Port Sorell. The attendance was terrific, and all agreed that it had been a thoroughly enjoyable and interesting day. All thanks must go to organisers Basil 7BL and Max 7MX, also to all the Northern Zone people who helped to considerably swell the ranks.

Last meeting was held on the 7th and was well attended as usual. We were pleased to welcome several visitors, including former Southern Zoners Mike 7ZAV and Charlie 7CH, who are now living in Burnie.

There have been several good openings recently on 2 mx, particularly over the Easter break. Many VK3s were contacted, Kevin 7ZAH using only 5 watts.

Seems we are losing one of our newer, and keenest, Hams. Basil 7BL is departing for VE land in August. Best of luck, Basil. 73, 7ZBH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month, and remittance should accompany the advertisement. Call signs are now permitted in Hamads. Dealers' advertisements not accepted in this column.

COLLINS 32S1 S.s.b. Transmitter with 516F a.c. power supply, unused, £380. National HRO-60 Receiver, complete, as new, £325. Finance can be arranged. VK3TD, "Cheviot," Stephens Road, Mt. Eliza, Vic. Tel. 7-1407.

FOR SALE: English Minimitter Tx, all bands 80-10 metres, t.v.i. proof, 150w. c.w., 120w. a.m., good condition and performer, also home-made "Z" Match Antenna Coupler, with in-built S.w.r. Meter, £80, o.n.o. Home-made 120w. rack mounted Tx, 80-10 metres, pair 807s push-pull in final, modulator pair 807s zero bias, UM3 Modulation Trans., power trans., 1,000v. aside tapped at 750v. and 500v, Geloso and Command V.f.o's., easily converted to d.s.b., £25, o.n.o. Philips 2-inch C.r.o. with spare tube, £7/10/0. Give-away equipment to buyers of above. G. P. Butler (VK3GB), 70 May St., Nth. Fitzroy, Vic. Phone 48-2883.

FOR SALE: Kokusai Mechanical Filter, Type MF-455-10-K, bandwidth 2.1 Kc., c/w. circuit and all specifications, £10. A & R Filter Choke, 300 mA. swinging, 5/20 Henry, £2. VK-3AHT, Phone 314-6760 (Vic.).

FOR SALE: Heathkits—11 tube C.r.o. 5 Mc. bandwidth, Model 0-12; Audio Sine Wave-Square Wave Oscillator, 20 c.p.s.-1 Mc., Model AG-10; Sweep Generator, 5 Mc.-220 Mc; Audio Millivoltmeter, range 10 mV.-300 volts; Tube Checker and Case; Balun 75-300 ohm; Ham Band V.f.o. All complete and new. Best offer to VK3AMW, 23 Winters Way, Doncaster, Vic. or telephone 857-6482.

FOR SALE: Wagner Sideband Transceiver. Upper or Lower Sideband or break-in c.w. on all bands 80 through 10 mx. 2.1 kc. Mechanical Filter, built-in vox, p.t.t., Xtal Cal., S Meter, Linear Relay, etc. Separate V.f.o's with 1 kc. accuracy for transmit and receive. Complete with Speaker and a.c. power supply in matching cabinets, in as new condition, still under guarantee. £350 or offer. VK2DM, 40 Ware St., Fairfield, N.S.W. Phone 72-5601.

GELOSO G222-TR Transmitter, new condition, £85. Command Transmitter, 4-5.3 Mc., unmodified, £5/10/0. New Geloso 4/102 V.f.o., £6. H. Webber, VK3PW, Phone 50-6023.

HAND wound Time Clocks, 7 and 14 days. Electrical movements, 1 and 2 hour. Coin-in-slot mechanisms. If any interested, call in and collect. O. G. Washfold, VK3AEW, Cr. Jacka and McNamara Sts., Ferny Creek, Vic. Phone Sassafras 67.

KWM2 Collins with power Pack 516F/2. Station control 312B/4. All in mint condition, with mains transformer, ready to plug in and go. Including a 3-band trapped dipole. Will sell separately. Norman Schroeder, Lot 1, Helene St., Eltham, Vic. Ph. 439-8142.

SELL: Command Rx Q5ers (incomplete), £5; 3-6, £10; 6-9, £7½; Tx 3-4, £6; 4-5.3 and 5.3-7, £5; TA12, £7½; MN26C with pwr. pack, £15. Pwr. and mod. trans., chokes, f. & v. capacitors, resistors, tubes, sockets and shields. Genemotors and shaded pole motors, many oddments. Syd. Clark, VK3ASC, Phone 45-3002 (Melb.).

SELL: Step-down Transformer 1 k.v.a. Primary 8 taps 180v. to 250v., Secondary 115v. Ideal for Collins transmitter or transceiver. 146a Cotham Rd., Kew, Vic. Phone 80-3777.

TYPE S Power Supply, good condition, 240 volt a.c. to 550 volts 200 mA., 300 volt 100 mA., 250 volt 80 mA., £8. ATR2B Transceiver and 240 volt a.c. supply, mod. for ship's frequency, 2.5 to 7 Mc., £15. ART13 Transmitter by Collins, good condition, all tubes, 2/811s mod., 813 final, complete with manual, £25. VK2AAK, Kulnura,. N.S.W.

WANTED TO SELL: Type 3 Mk. II. Transceiver with built-in modulator, speaker, netting switch, spare tubes, key, new crystal mike, instruction book, £25. Also W2EWL Phasing Type S.s.b. Transmitter, no power supply, £20. Other Ham gear. VK3AHG 29-7609 (Melb.).

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REMOVAL SALE

To facilitate our forthcoming move to new premises stock must be drastically reduced. This means big price reductions and a unique opportunity for you.

AMPLIFIERS, Pioneer SM-B160

Features

Twin A.M. Tuners with Short Wave Band 3.8 to 12 Mc.
9 watts per Channel.
12 Valves.
Freq. response: 20 to 20K c.p.s. ±1 db.
S/N. Ratio exceeds 60 db.
Hum and Noise less than 3 mV.
Channel separation 50 db.
Input for Crystal or Ceramic Cartridge.
Output: 4, 8 or 16 ohms, Centre Amplifier, Tape.

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+ Freight to cover weight 25 lb.

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A.C./D.C. Volts: Up to 700.
D.C. Current: 0-100, 0-1.4, 0-140 mA.
A.C. Current: 0-200 mA.
Resistance: 0-50K ohms, 0-5 megohms.
Capacity: 0-1 μF., 0-100 μF.
Inductance: 0-1,000 H.
Decibels: —15 to +59.
Features: Tube emission G.M., Mirror Scale.
Accessories supplied: V.I.G. Probe, E.H.T. Probe 0-17.5 k.v., Cap. Ind. Adaptor.
Size: 6½" x 4" x 2¼".

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POCKET SIZE. Six Transistor Radios attractively boxed with carrying case and earpiece. Complete with battery.

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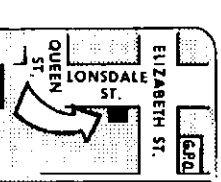

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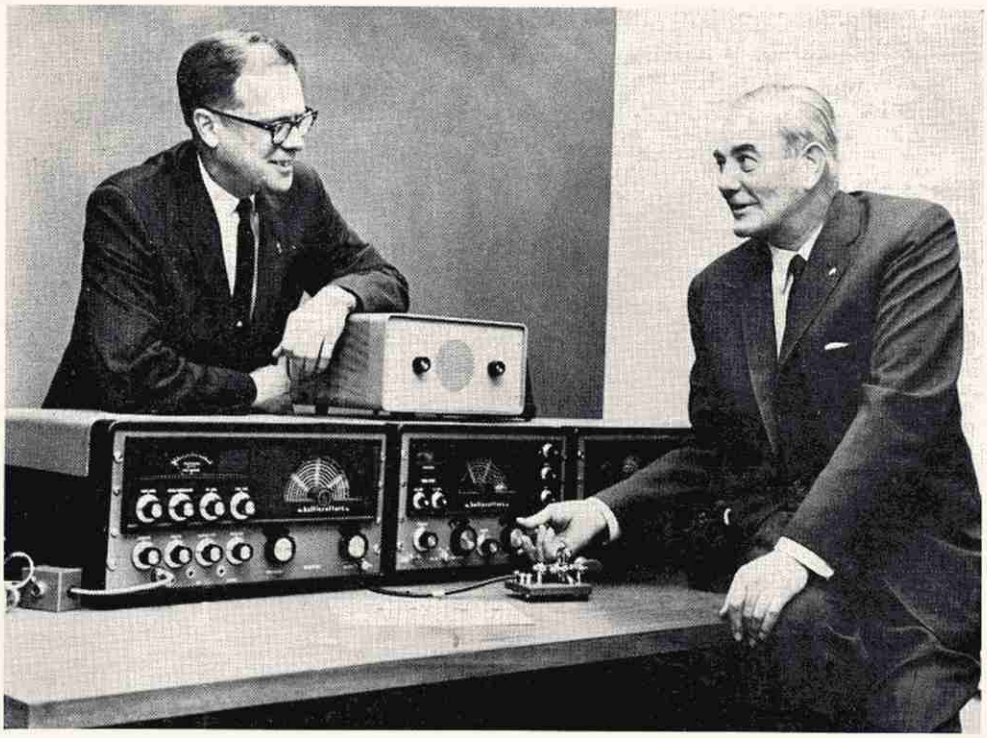
AMATEUR RADIO

JUNE 1964



Vol. 32, No. 6

2/-

Registered at G.P.O., Melbourne, for transmission by post as a periodical

NEW VALVES AT BARGAIN PRICES

1A3	2/6	10 a £1	2X2	5/-	5 a £1	6C8	10/-		8SK7GT	20/-		12BE6	5/6	3 a £1	830B	15/-		ECH35	7/6	
1A5	5/-	5 a £1	3A5	10/-		6CM5	25/-		8SL7WGT	12/6		12C8	5/-	5 a £1	832A	19/6		EF39	5/-	5a £1
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1D8	7/6	3 a £1	5R4GY	20/-		6F6	12/6		8SQ7GT	22/-		12J5	5/-	5 a £1	884	10/-			and socket	3/6
1F5	10/-		5U4GB	14/6		6F8	5/-	5 a £1	8SS7	7/6	3 a £1	12SA7GT	10/-		951	5/-	5 a £1	EF70	5/-	5 a £1
1H5	7/6	3 a £1	5V1G	17/6		6G6G	7/6	3 a £1	6U8	17/-		12SC7	5/-	5 a £1	955	5/-	5 a £1	EF72	5/-	5 a £1
1H6	5/-	5 a £1	5Y3GT	13/9		6G8G	26/-		6V4	11/4		12SK7	5/-	5 a £1	956	5/-	5 a £1	EF73	5/-	5 a £1
1K1	5/-	5 a £1	6A6	7/6	3 a £1	6H6GT	3/6	7 a £1	6V6GT	16/-		12SQ7	5/-	5 a £1	958A	2/6	10 a £1	EF86	26/-	
1K5	5/-	5 a £1	6AB7	10/-		6J5GT	10/-		6X4	10/-		12SR7	5/-	5 a £1	1616	20/-		EL41	10/-	
1K7	5/-	5 a £1	6AC7	5/-	5 a £1	6J6	10/-		6X5	15/-		19	1/6	15 a £1	1625	5/-	5 a £1	EY91	5/-	5 a £1
1L1	5/-	5 a £1	6AG5	5/-	5 a £1	6K7	5/-	5 a £1	6Y6	5/-	5 a £1	30	1/3	18 a £1	1626	5/-	5 a £1	KT61	(6V6)	15/-
1LN5	(CV281)			5/-	5 a £1	6K8GT	12/6		7A8	2/-	11 a £1	47	3/6	7 a £1	1629	5/-	5 a £1	QQE04/20		£3½
	5/-	5 a £1	6AJ5	7/6	3 a £1	6L6	Metal	17/6	7C5	5/-	5 a £1	57	4/-	6 a £1	2051	5/-	5 a £1	QQV06/40		95/6
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1L5	2/-	10 a £1	6AL5	14/-		6L7	5/-	5 a £1	7E6	3/6	7 a £1	717A	7/6	3 a £1	Socket to suit		£1	VR53	5/-	5 a £1
1Q5	5/-	5 a £1	6AM5	15/-		6R7	7/6	3 a £1	7W7	2/6	10 a £1	725A	20/-		5763	28/-		VR100	(6U7)	7/6
1S2	18/-		6AM6	(EF91)	10/-	6SC7	7/6	3 a £1	12A6	4/-	6 a £1				9002	10/-		VR102	5/-	5 a £1
1S5	10/-		6AS7GT	28/-		6SF5	7/6	3 a £1	12AH7	5/-	5 a £1	808	10/-		9004	5/-	5 a £1	VR103	5/-	5 a £1
1T4	10/-		6B6	7/6	3 a £1	6SF7	7/6	3 a £1	12AT7	15/-		809	20/-		AV11	2/11	8 a £1	VR136	2/-	12 a £1
2A5	7/6	3 a £1	6B8	metal	17/6	6SH7	1/-	6 a £1	12AU7	15/-		815	15/-		EA50	2/-	11 a £1	VR137	2/6	10 a £1
2A6	7/6	3 a £1	6BE6	15/-					12AV6	7/6	3 a £1	829B	£3		ECC35	20/-		VT78	(6D6)	5/-
2C42	15/-		6BQ5	17/-		6SJ7	12/6								ECH33	20/-		VT127	5/-	5 a £1
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2D21	12/-		6C6	5/-	5 a £1															

Packing and Postage 5d. per Valve.

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M065 0-1 mA., 3¼ in. rnd., bakelite case, 35/-
M065 0-50 mA. d.c., 3¼ in. rnd., bakelite, 37/6
M065 0-150 mA. d.c., 3¼ in. rnd., bakelite, 37/6
M065 0-250 mA. d.c., 3¼ in. rnd., bakelite, 37/6
M065 0-500 mA. d.c., 3¼ in. rnd., bakelite, 37/6
MR1P 0-1 mA., 1¾ in. square face, 1 in. round hole, clear plastic case 32/6
MR2P 1¾ in. square face, 1½ in. round hole, clear plastic case:—
MR2P 50 uA. 47/6
MR2P 500 uA. 37/6
MR2P 1 mA. 35/-
MR2P 50 mA. 35/-
MR2P "VU" Meter 45/-
MR2P "S" Meter (reads S1 to 9 plus 10 to 30 db. F.S.D. 1 mA.) 45/-
HCR62 edgewise "S" Meter £1/10/0
MR3P 3 x 3 in. square face, 2¾ in. round hole, clear plastic case:—
MR3P 1 mA. 47/6
MR3P "VU" Meter £3/17/6
MR52 2¼ in. square face, 2 in. round hole, black bakelite case:—
MR52 100 uA. 63/-
MR52 1 mA. 40/-
MR65 3¼ in. square face, 2½ in. round hole, black bakelite case:—
MR65 1 mA. 47/6
MR65 "VU" Meter £4/2/6
SO45 1¾ in. round face, 1¾ in. round hole, black bakelite case:—
SO45 20 Volt A.C. 35/-
SO45 30 Volt A.C. 35/-
G.E.C. Meters, 3¼ in. round face, 2½ in. hole, black metal case, 0-50 mA. 25/-
Packing and Postage 2/6

BARGAINS! — BARGAINS!

Crystal Earpieces with plug **6/6**
Actuating Diaphragm Inserts **7/6**
7-pin Valve Sockets and Shields ..... **16 for £1**
1N1763 (OA210) Diodes, 400v. 500 mA. ..... **7/6 each**
2-Core P.V.C. Covered Cable, ¼" diam. **1/- yd.** or **100 yds. £4/5/0.**
2-Core Microphone Cable, ¼" diam., 2 x 7/0076 ..... **2/9 yd.**
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Sizes: 16, 18, 20, 25, and 30 mm.
Price £3/7/6 set Packing and Postage 2/6

ENGLISH INDICATOR UNITS TYPE 1

Contains: one 6" c.r. tube VCRX263, three CV327/EF52, five CV858/ECC91/6J6, two CV140/EB91/6AL5, and one 6V6GT. Brand new condition. £5/0/0. 5/- delivery charge to railhead.

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300 μA. movement.
AC and DC voltages: 0-10, 0-50, 0-250, 0-500, 0-1000v.
Current ranges (mA.) 0-1, 0-100, 0-500 mA.
Ohms range: 0-100,000 ohms.
Size: 3¾ x 2½ x 1¾ inches.
Complete with leads.
Price only £3, post paid.

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Roblan, 10-415 pF., one-gang **25/-**
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10 to 365 pF. Ideal for Crystal Set. **10/- each.**
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50 ohm, UR67, 3/8" diam., in 25 yd. Rolls **25/-**; or 1/6 yard.
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μF.	V.	Price	μF.	V.	Price
5	12	3/-	25	12	3/6
8	6	3/-	25	25	4/-
8	12	3/-	*32	350	4/6
8	300	6/-	*32	300	4/6
8	600	6/-	32	350	8/6
10	12	3/6	50	12	3/6
10	3	3/-	64	18	4/-
16	300	6/-	100	12	4/-
16	600	8/6	100	6	4/-
24	350	8/-	1000	6	9/6
25	50	5/-	1000	12	13/-
25	3	3/-	1000	18	15/7
25	6	3/3	* Disposal type		

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Complete with earphones and instructions, **22/6.** Aerial wire to suit, 4d. yd.
Packing and Postage 2/-

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Crystal locked 150 Mc. 12 Valves: two 3S4, four 1T4, one 1L4, one 1S5, four 3V4, one DF62 and 12 Mc. Vacuum Xtal. Complete with 12 volt D.C. Power Supply, suitable for conversion to 146 Mc. New condtion. **Price 17/10/0.**

VERNIER DIALS T-501

Ratio 8 to 1 reduction, 1½ inch diam., scaled 0-10. **Price £1** inc. tax.
Packing and Postage 11d.

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North Balwyn tram passes corner. Money Orders and Postal Notes payable North Hawthorn P.O. 3/6 Packing Charge.

We sell and recommend Leader Test Equipment, Pioneer Stereo Equipment and Speakers, Hitachi Radio Valves and Transistor Radios, Kew Brand Meters, A. & R. Transformers and Transistor Power Supplies, Ducon Condensers, Welwyn Resistors, etc.

"AMATEUR RADIO"

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JUNE 1964
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★

All matters pertaining to "A.R.," other than subscriptions, should be addressed to:

THE EDITOR,
"AMATEUR RADIO,"
P.O. BOX 36,
EAST MELBOURNE, C.2, VIC.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

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OUR COVER

Herbert Hoover, Jnr. (right), President of the American Radio Relay League, tests the sending and receiving equipment housed in a Ham shack at the New York World's Fair while John Huntoon, A.R.R.L. General Manager, looks on.

(Photo courtesy Coca-Cola Company.)

FEDERAL COMMENT

★

AMATEUR SATELLITES

"In accordance with actions taken at the Extraordinary Administrative Radio Conference on Space Communications of the I.T.U. held in Geneva last year, and in agreement with the conversations between I.A.R.U. representatives thereto, the A.R.R.L. cordially invites Member Societies to participate more fully in a Radio Amateur space communications programme utilising satellites created by Amateurs."

In the few words of this injunction by the A.R.R.L. to Member Societies is contained a wealth of meaning. These words indicate in a non-flamboyant way, the extent of experimentation and progress made by Radio Amateurs in little more than 50 years of existence. The most far-seeing Amateur soothsayer around 1914 could never have envisaged that in such a short time, Amateurs would be "creating" and communicating via their own satellite. Such, however, is progress.

It has been proven that even the most far-seeing scientists and technologists at any particular time can cast predictions with only about 66% accuracy of what will actually be the case in the future. That is to say, if an aeronautical specialist today predicts that in 10 years time aircraft will attain a speed of mach 6, when the time arrives they will actually be flying at about mach 9. If we follow this analogy into the Radio Amateur field, we can assume similar seeming-impossibilities in the communications field.

Is it not therefore possible that in not too many years time, all v.h.f. and u.h.f. communication will be just as easy by Amateur satellites as by the use of the ionosphere? Let us hasten to say that no such prediction will ever be fact without a great deal of endeavour. It is this endeavour of the Radio Amateur that has kept him ahead of commercial developments in a number of communication fields. The opportunity is now here for Amateurs to experiment and develop a new system of DX communication in the bands where such is not consistently possible by normal means.

The launching of the Oscar repeater satellite (Oscar III.) is expected in about September this year. The A.R.R.L. anticipate forwarding technical data on this unique experiment to the W.I.A. shortly, which in turn will be passed on to the members via this journal. As this undertaking will involve a great deal of time and money by its promoters, we hope many of our members will take this opportunity and assist by using the facilities presented.

We agree with the A.R.R.L. that the expansion of self-education of the Amateur and the study of this new field of communication are essential to keep abreast of the state of the art. By co-operation in this venture, we will undoubtedly help in the promotion of bigger and more exotic Amateur satellites which may well become our stable means of international communication in the not-so-distant future. We hope to hear many calls of CQ DX Oscar before the end of the year on 144 Mc.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

MULLARD PREFERRED RANGE OF TRANSISTORS

For Entertainment Applications

More comprehensive data and curves are contained in Volume 4 of the Mullard Technical Handbook. Additional enquiries should be directed to the Technical Service Departments at the addresses shown below.

Type Number	Description and Application	$-V_{CB}$ max (V)	$-V_{CE}$ max (V)	$-V_{EB}$ max (V)	$-I_C$ max (mA)	$-I_B$ max (mA)	T_j max (°C)	P_{tot} max T_{amb} 25°C (mW)	Outlines and Dimensions
AC125	General purpose audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	100	5	90*	500**	TO-1
AC126	High-gain audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	100	5	90*	500**	TO-1
AC127	n-p-n/p-n-p germanium alloy junction transistors for use in complementary Class 'B' output stages	+32	+32	+10	+200	+10	90*	280**	TO-1
AC132		32	32	10	200	10	90*	500**	TO-1
AC128 **2-AC128**	High-gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	32	32	10	1A	20	90*	550**	TO-1
AD140 **2-AD140**	Germanium junction power transistor of the p-n-p alloy type intended for use as an amplifier in the output stages of receivers and amplifiers operating from either battery or AC mains.	55	55	10	3·0A	500	100*	35W**	TO-3
AF114N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s	32	32	—	10	1	75	50***	TO-44
AF115N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s as mixer-oscillator and for use as RF amplifier up to 27Mc/s	32	32	—	10	1	75	50***	TO-44
AF116N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer-oscillator and RF amplifier up to 16Mc/s	32	32	—	10	1	75	50***	TO-44
AF117N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer-oscillator and RF amplifier up to 6Mc/s	32	32	—	10	1	75	50***	TO-44
OC74N **2-OC74N**	High-gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	20	20	6	300	—	90*	550**	TO-1

*** T_{amb} = 45°C ** with suitable heat sink * 200 hours operation

HOTTING UP THE HE-30 RECEIVER

C. P. SINGLETON,* VK4UX

A FEW months ago, I became the owner of one of the above receivers and after trying it out for a few weeks, I came to the conclusion that I either had a "dud" receiver or else that I was being super critical. For general listening, the receiver performed quite well, but I thought it was lacking something. Summarising the points that I didn't like about it, I came to these conclusions:

(a) Frequency shift of the h.f. oscillator, whenever the i.f. gain control was varied, especially when using the receiver for c.w. or s.s.b. reception. This was due to the varying voltage on the oscillator, caused by the varying voltage drop across the filter resistor R23 whenever the bias on the i.f. stage was varied.

(b) Very unsatisfactory a.v.c. action. The a.v.c., as fitted, is simple a.v.c. and naturally will work on any signal, no matter how weak, thus reducing the sensitivity of the receiver with weak signals.

(c) The noise limiter could be improved.

(d) Impossible to get "single signal effect" on c.w., due to unwanted leakage from the b.f.o.

(e) Very poor image rejection on 14 Mc.

Since curing the above faults in my receiver, I have spoken to quite a few chaps who are experiencing the asme trouble and this has prompted me to write this article, and consequently save wear and tear on my "mill", typing out condensed versions of the above modifications.

The receiver is well made and easy to get at, and the above faults can be attended to in a few hours. With that, I'll cut the chatter, and get down to business, so grab your soldering iron, etc., and we'll get to work.

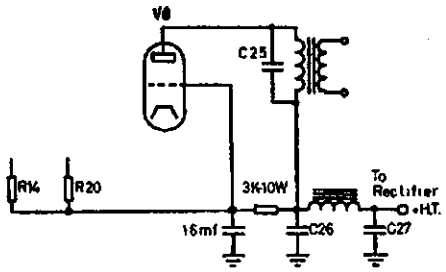

Fig. 1.

If you examine the circuit you will notice that the h.t. available to the receiver is only 115 volts. Nothing wrong with this, except that it is a bit difficult to get a VR tube to strike at this voltage. So the first thing to do is to get some more volts. It is also necessary to take into consideration the rated output of the power supply and not to exceed it. The h.t. drain of the modified receiver is within a few mills. of what it was originally. So assuming you have sent the wife out for the day, and have commandeered the kitchen table, let's go . . .

* 4 Sydney Street, Ayr, North Queensland.

MODIFICATIONS

(1) Remove resistor R23 and substitute it with a 100 mA. filter choke. This can be fitted at the right of the condenser C26-27. The choke that I used was quite small and fitted in with room to spare.

(2) Remove the h.t. connection from the receiver side of the filter choke, and fit a 3,000 ohm 10 watt resistor, between the choke and the h.t. line, also change the h.t. supply to the 6AQ5 plate, from C27 to C26. Then disconnect the lead going from the UY socket to h.t. The above modification will give approx. 200 volts to the 6AQ5 plate and approx. 115 volts to the 6AQ5 screen and 6AV6 (V7), and also the 6BA6 valves (V5 and V6). See Fig. 1.

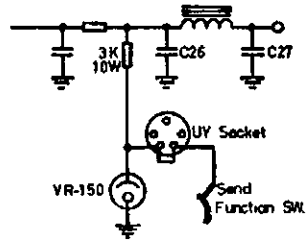

Fig. 2.

(3) Disconnect the h.t. plate supply at point "B" (r.f. stage), decouple it right at point "B" with 1,000 ohms and 0.05 μF. and reconnect it to the set side of the filter choke. Also do the same with the mixer plate supply (V2). This tube is already decoupled, but as the decoupling condenser is also the screen by-pass of V2, install another 0.05 μF. at the screen of V2. That looks after the plate supply of the mixer and r.f. stage.

(4) Disconnect the screen grid lead of V2 (mixer) from where it ties onto the first i.f. and reconnect it to the lead going to **Rec.** on the function switch. The screen grids of both V1 and V2, together with the h.t. to the h.f. oscillator, are now tied together, and go to the Rec. point on the function switch.

(5) Now to fit a voltage regulator tube. Connect a 3,000 ohm 10 watt resistor between the terminal on the UY socket that was originally h.t. (previously disconnected) and C26. On the UY socket side of the resistor, fit a VR105, or equivalent, between this point and earth. The VR tube will fit just in front of the power transformer. This now gives a regulated voltage of 105 volts to the screens of the r.f. and mixer stages, and also the h.f. oscillator. As the "Q" multiplier is also controlled from this switch, it will also have a regulated supply. See Fig. 2.

(6) Change the bias resistor of V1 to 68 ohms. You will notice that I haven't altered the i.f. channel. Approx. 115 volts is available to the plates and screens of the i.f. stages and playing around with the plate and screen voltages would upset the bias resistor values, and a certain amount of mucking about would have to be carried out to get the "S" meter to read correctly. Anyway, the i.f. stages work quite well with the original voltage values, so there is no point in altering it.

(7) Delayed a.v.c. is a must on a good communications receiver, and the circuit used is quite straight forward. You will notice that the signal for the a.v.c. diode is taken from the plate of V6. This reduces the damping on the i.f. secondary, which would occur if the a.v.c. signal was taken from there. See Fig. 3.

(8) The noise limiter I used is a very well known one and easily installed. But if you do not want to go to the bother of fitting it, an ordinary diode such as the 1N34 type of thing, connected between the 6AQ5 grid and ground, via the a.n.l. switch, will give results as good as the original.

(9) Getting the b.f.o. to operate better is quite easy. With the set upside down, and the dial towards you, you will see a lead going from a ceramic condenser (C9) to the switch on the back of the selectivity control. Remove this lead and substitute for it a piece of co-axial cable. This will stop the unwanted leakage to other parts of the receiver and make s.s.b. a lot easier to resolve.

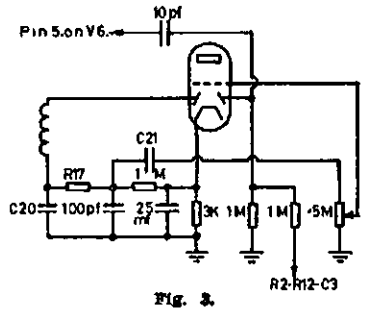

Fig. 3.

(10) Getting rid of images can be done in a variety of ways. I took the easy way out and made up a small tuner of two circuits. One parallel and one series, which are closely coupled. The series circuit is connected directly across the receiver aerial terminals. Remembering that a series tuned circuit has low impedance to the frequency to which it is tuned, and high impedance to all others, and that a parallel tuned circuit is just the opposite, you will see how it works. Tune the receiver to the unwanted image, and then reject it with the series circuit. Peak the parallel circuit to the wanted signal. A pre-selector would do a better job I suppose, but it would mean switching

(Continued on Page 5)

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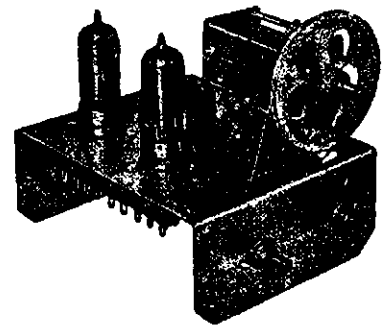

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1.8, 3.5, 7 Mc. PORTABLE TRANSMITTER

P. E. LINDEN, VK3BX*

THIS little transmitter is what it was designed to be—the simplest possible combination of components from the junk box which would put out a mobile/portable a.m. signal on 1.8, 3.5 and 7 Mc.

For the sake of simplicity, and because it was designed primarily for use on the 1825 Kc. net frequency, a v.f.o. was not included. All valves and components used are readily available.

Nothing original is claimed about the circuit except for the output tank coil, which is wound on a ferrite toroid, giving a number of advantages discussed later on.

The crystal oscillator uses a "Modified Pierce" circuit, with the crystal connected between the control grid and screen grid of the 12BY7 pentode. The oscillator is thus electron coupled to the plate circuit which is untuned, with an r.f. choke as the plate load. The 15 pF. and 47 pF. capacitors from the grid and screen to earth are necessary to ensure reliable starting of the crystal at 1825 Kc., and also to provide the correct input capacitance.

The r.f. output from the 12BY7 plate is capacitively coupled to the grid of the 6BQ5, and adequate drive is obtained on all three bands. The 6BQ5 grid current ranges between 2 and 3 mA.

The one possible original feature of the transmitter is the output tank coil, which is wound on a Ducon Q2 toroid, with a surprising reduction in number of turns, as will be seen from the circuit. Only 22 turns were required to resonate with 300 pF. at 1825 Kc.

* 1 Bishop Court, Mt. Waverley, Vic.

Front panel, left to right. Top: receiver power output, 6-12 volt heater switch, coax. output to receiver, coax. output to antenna. Centre: power input plug, plate meter, bandswitch. Bottom: microphone jack, crystal socket, final plate tuning, antenna loading.

The winding is tapped at 7 turns and 13 turns up from the aerial end for 3.5 Mc. and 7 Mc. respectively. These turns give the correct inductance to resonate with the optimum tank circuit capacitance, obtained from the Abac in the R.S.G.B. Handbook. The correct dynamic load impedance is thus presented to the 6BQ5 on all bands.

A two-pole five-position bandswitch is used, and the first and third positions switch in additional fixed values of loading capacitance on 1.8 and 3.5 Mc. Note that the bandswitch does not progressively short out the coil turns, as is common practice with an air wound coil.

With the values shown, the pi-coupler will match to a wide range of aerial impedances on all bands.

The modulator is again as simple as possible, consistant with good audio quality. A 12AT7 twin triode operates in cascade as a microphone amplifier and voltage amplifier to drive a 6BQ5 as a class A modulator. A 10,000 ohm plate-to-plate speaker transformer is used as a modulation transformer. With a 1 : 1 ratio, the 6250 ohm load of the final is fairly closely matched to the 7,000 ohm load impedance required by the class A 6BQ5 modulator.

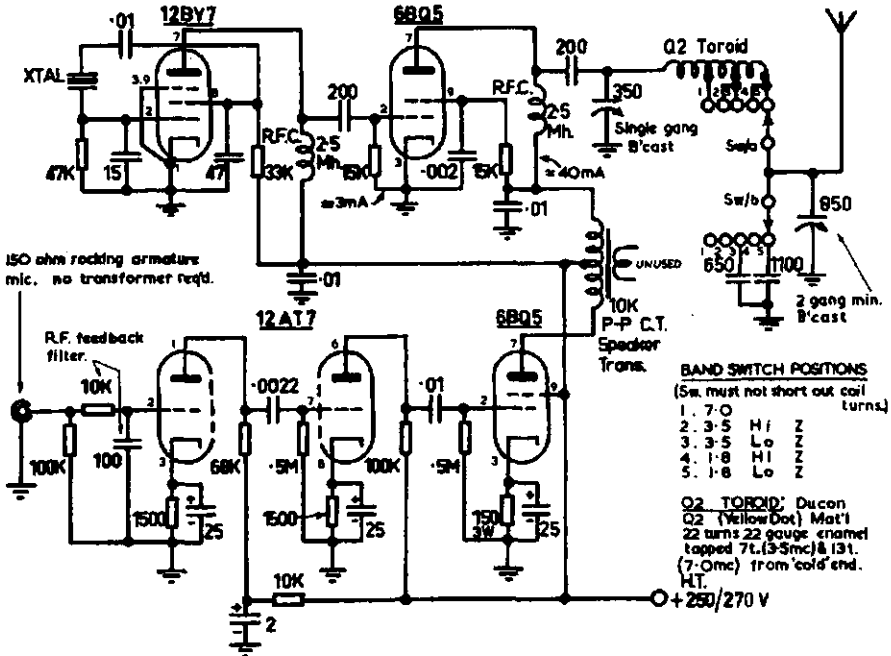
The microphone used is a rocking armature insert obtained from disposals.

Resistance values used throughout the modulator section were selected to give maximum gain and minimum distortion. Full modulation is obtained with the microphone feeding directly into the first grid without a microphone transformer. No gain control was provided, as 100 per cent. modulation was achieved (with excellent quality) when speaking in an ordinary voice close to the microphone.

Results with this little transmitter have been really gratifying. On 1825 Kc., with a 200 ft. long wire antenna, and a good earth, R5 S5 signals have been received in all adjacent States at night, with S9 signals throughout the metropolitan area.

During the day, when operating portable from Phillip Island, from a genemotor supply and a 100 ft. antenna, S7 signals were received in Melbourne, a distance of about 40 miles airline.

On 3.5 and 7 Mc. interstate contacts are easily made with reasonable band conditions. ●



HOTTING UP THE HE-30 RX

(Continued from Page 3)

it in or out, or switching coils, whereas with this gadget, there is no need to remove it or alter its tuning when going from 14 Mc. to 7 or 3.5 Mc.

You will notice from the modifications that I have made no provision for switching off the h.t. to the r.f. and mixer plates. There isn't any necessity to do this as with no screen voltage on these tubes the set is completely dead.

This completes the modifications. The receiver has very good selectivity on a.m. when using the "Q" multiplier, but as this stage also functions as a b.f.o., the selectivity can be improved as far as s.s.b. and c.w. are concerned. Some time in the future I intend fitting a product detector and another b.f.o. and then the "Q" multiplier can be used on s.s.b. Although not mentioned in detail in the instruction book, the "Q" multiplier can be used to reject an unwanted signal. ●

LIKE NEW MIXER CIRCUIT IN THE BC348

P. D. WILLIAMS, VK3IZ*

REVIEWS of new motor cars always look impressive, but no one seems inclined to review them with 12 months' work behind them. Perhaps the result of such a test would be favourable. There is certainly one electronic article that lives up to the claims made by the authors, at least as far as this writer is concerned.

In "Amateur Radio" for June 1962 an article titled the "Like New Mixer Circuit" was reprinted from "73" Magazine. Investigation seemed to indicate that there were virtues to the idea and a decision was made to attack a BC348Q receiver to see whether the authors' claims were vindicated.

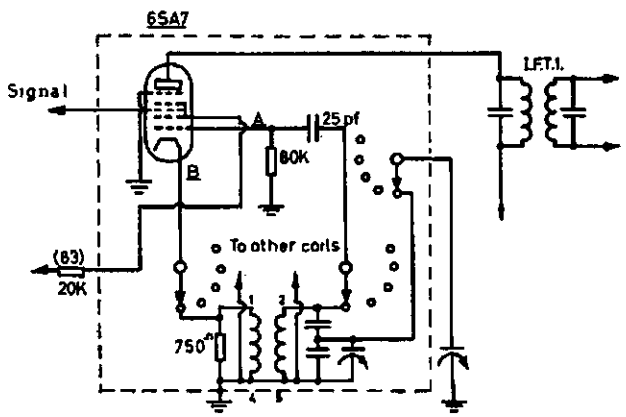


Fig.1. Original OSC-MIXER circuit BC-348Q.(simplified)

Owners of BC348 receivers of any model have a good fundamental receiver, but leaving the problem of selectivity aside, all suffer from the one complaint—a noisy mixer, which in the writer's 348Q was a 6SA7.

It is believed that the justification for this brief note is the number of BC-348s still in use by a large number of Amateurs and S.w.l's. and also because the principles can be applied to any receiver currently in use.

To work, then, after studying the before and after schematics. You will notice that the "Like New Mixer Circuit" is unaltered but a version of a suitable oscillator and cathode follower is shown. The arrangement is simple and output is reasonably constant—probably due to a slight degeneration inherent in having an r.f. potential at the cathode.

In addition, the signal is not taken from the tank circuit of the oscillator which improves isolation somewhat.

An inspection of the oscillator section of the 348Q shows that there is little space for two tubes, but you can get the 12AU7 and 12AT7 in there side by side and in the same relative position as that originally occupied by the 6SA7. Getting the oscillator coil box out presents little difficulty and with the side cover off the socket and bracket holding the 6SA7 tube can be removed.

A new bracket to take valve sockets for the 12AT7 and 12AU7 can follow the same shape as the old one and then quite a few of the components can be installed before the bracket is attached to the oscillator box using self tapping screws.

As the faint-hearted have weakened at the thought of what might lie ahead, a blow by blow description is not given of what component goes where. Since there is little space to fit everything it is quite in order to use the phrase —placement of components is not critical—as there will not be long leads anywhere! The simplified and modified schematics show numbered coil and lettered portions of the circuit where the old and new wiring are connected.

Resistors used in the high tension department are mounted externally to the coil box, but little difficulty was found in placing them neatly on the chassis. Values given were suitable for this installation, but as the author of the original article said, some fiddling with values may be necessary to get 150v. on the plate of the first section of the 12AT7.

There appears little more remains to be said—the circuit performed well from the first switch-on and after a slight realignment, a period of critical listening could not fault the circuit in any way.

To those owners of BC348 E, M, P, etc., using a 6J7 as a mixer and a 6C5 as an oscillator, the problem may be a little easier as there would be little point in reconstructing the oscillator circuit. However, no matter what receiver you have, the principle remains the same and the writer has heard of satisfactory conversions on AR7s and others.

The only limiting factor to good listening is the noise level on the bands of late but don't let this dissuade you. ●

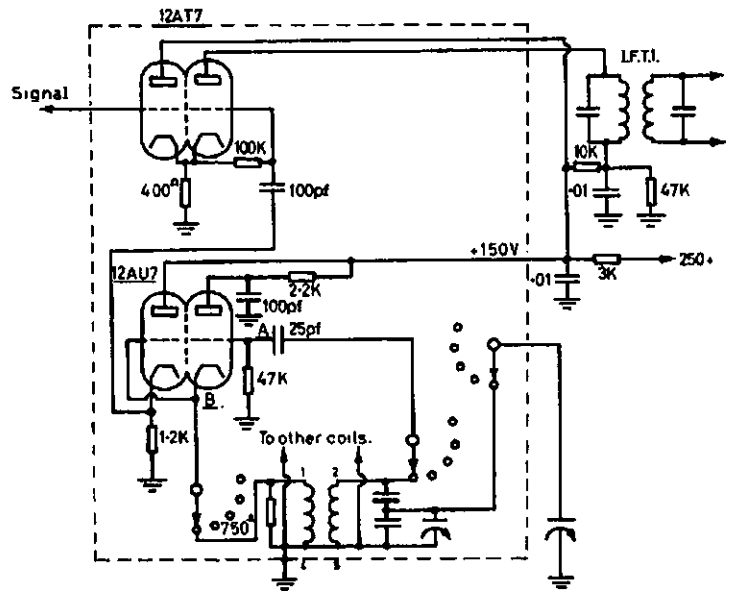


Fig.2. Modified MIXER circuit.

* "Pine Tree Lodge," Ingrama Rd., Research, Vic.

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2360 Mc.:
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NEW HEATER RATINGS FOR 6AN7 AND 6BH5

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They are now being manufactured with a new heater rating of 6.3v. at 300 mA., included in the Mullard Preferred Range and, to indicate this change, their type numbers will now be known as 6AN7A and 6BH5A.

In most applications the respective increase in heater ratings may be ignored so far as the mains transformer is concerned. Where the 6AN7A or 6BH5A are used in a series heater string arrangement, shunt resistors may be dispensed with.

—Reprinted from "Mullard Outlook," Australian Edition, Nov.-Dec., 1963.

MAKING THE AR8 PERFORM

AL SHAWSMITH, VK4SS*

The AR8, by any imagination, could hardly be claimed to be a receiver pleasing to the eye. It sits squat and square; the front panel lower knobs are arranged in a disorderly manner, while the round vernier dials, situated near the top of the panel, stare out like two goitered eyes.

Electronically, in the raw state, it is no more appealing and quite unsuitable for Ham use without several modifications. However, if one can stand its appearance, it can be improved to perform like a decent receiver.

The main drawbacks with the AR8 are: (a) no bandspread, (b) poor r.f. gain, (c) no i.f. selectivity, and (d) poor audio output.

BANDSPREADING

A good look at the tuning arrangement showed that bandspreading would not be a difficult job. To do this, it is necessary to scrap the l.f. section of the r.f. assembly, retaining only the three-gang tuning condenser, which can be left as is, but is best if all variable plates except two are removed from each section. Bandspreading is then accomplished as shown in Fig. 1.

R.F. GAIN

A 6SG7 was substituted for the original r.f. tube, but any low-noise tube will do. This modification caused the expected to happen . . . r.f. oscillation. A closer look showed that this was due mainly to the physical layout of the r.f. section in that the plate lead of the converter tube is approximately ¾" from the grid connection of the 6SG7. This oscillation can be tamed in three ways:

(1) Placing a small metal shield between the aforementioned socket connections.

(2) Removal of socket and replacement so that the grid circuit of the r.f. tube is as isolated as possible.

(3) Reducing the screen voltage on the r.f. tube.

The latter was chosen for two reasons. It was the simplest, and it allowed some controlled regeneration through the r.f.-mixer circuitry, which reduced images considerably, particularly with one r.f. stage on Band 3, i.e. 14 and 21 Mc.

First-tube bias could be increased to bring r.f. section out of oscillation, but this seriously impairs the signal-to-noise ratio of the 6SG7. The screen voltage was dropped until oscillation at resonance ceased; in this case, approximately 65-70 volts. This admittedly reduced the optimum signal-to-noise ratio a little, but with some regen. present, the r.f. bandwidth should be narrowed, increasing the signal-to-noise ratio. So what was lost on the roundabouts was gained on the swings. Couple the antenna fairly heavily to the r.f. coil.

* 35 Whynot Street, West End, Brisbane, Qld.

I.F. SELECTIVITY

This was accomplished to near s.s. selectivity (approx. S 7/8 to S 3/3) by the simple process of running a lead from the first i.f. across to the second i.f. (just loosely pushed into the top of the cans) until oscillation occurs with the i.f. gain control at full on and set on c.w. position.

Selectivity then is variable, i.e. the less i.f. gain, the greater the i.f. bandwidth. Here again the overall signal-to-noise ratio is improved by adding selectivity because the overall bandwidth is reduced.

It is said that regeneration introduced like this causes instability, as it varies with strong and weak signals. With the AR8 this arrangement worked perfectly, the regeneration being constant over a large section of each Ham band.

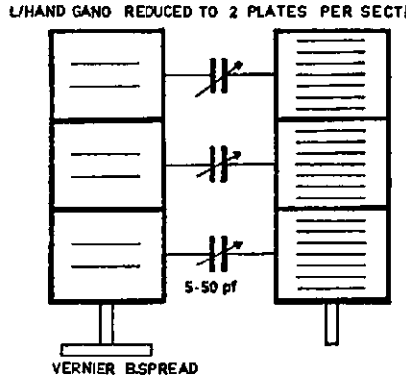


Fig. 1.—Method of Bandspreading. Vary the amount of bandspread by adjustment of 5-50 pF. trimmers.

AUDIO AND OTHER ITEMS

This modification is purely a conventional one, i.e. the voltage amplifier is replaced by a 6V6 or other pentode using a suitable output transformer to match the speaker or phones.

The chain drive should be removed from the potentiometers and an extended shaft on the i.f. pot. brought through the front panel. This will then allow separate i.f. and audio control. An r.f. gain control (10K w.w. pot.) can be mounted handy to the r.f. tube socket, on the front panel. For c.w. reception, it is best left full on, and for s.s.b. reduced to the most suitable position.

Also an extra heavy audio by-pass condenser on the 6V6 plate (say 0.01 μF. or greater) will allow cut-off of the higher frequencies and greatly reduce noise, QRN, etc. The amount of by-pass or cut-off is controlled by the tone control pot.

The tube filaments can be arranged to suit the power supplies (6v. or 12v.) and h.t. is about 250 volts.

These hints represent a no-cost simple approach, which will greatly improve performance. A more sophisticated approach would be to include a Q5er in the i.f. circuitry and a band-pass filter in the audio, and if the optimum in image ratio is wanted on Band 3, add another r.f. stage. However, we are dealing with an AR8 and the latter added electronics are up to the owner.

After the modifications have been done, a rough check on performance can be obtained by turning the receiver gain throughout, well up. It should still be fairly quiet and should spring to life with lots of QRN and signals when the aerial is coupled. If the set has excessive hiss and noise with no antenna, short out the i.f., converter, and r.f. grids in turn to see which stage is contributing the noise.

There can be criticisms to the above modifications, but we are dealing with an AR8, not an AR88. ●

— • • • —

Another Little Gimmick

If you have ever wanted to grid dip 7-8 mm. coils in 7/8th inch cans, you have probably found difficulties to that operation.

Faced with this problem in an unknown piece of equipment, having several signal and i.f. frequencies, the pick-up coil shown in the sketch (Fig. 1) was dreamt up.

When tried, results proved to be giving good indications with the g.d.o. and as close as necessary to determine the resonant frequencies of the various coils.

The tight bunch of turns in the small pick-up coil will affect the frequency of the coil under test at v.h.f., but has little effect at frequencies lower than 20 Mc.

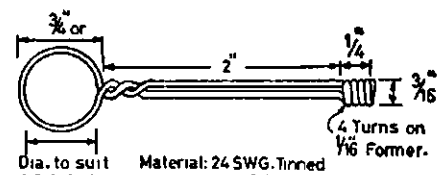


Fig. 1. "GIMMICK" Pickup loop.

If any case, the v.h.f. indications are still accurate enough to be within the tuning range of either variable slug or condensers for final adjustment.

Variations of the pick-up "Gimmick" can be used to grid dip some of those coils in awkward places round a chassis.

It is suggested that a minimum of twisting of the link line should be made, just sufficient to hold the large loop in position.

If it is desired to grid dip i.f. coils, it is necessary to remove one slug to insert the pick-up loop so as to get sufficient coupling to the coil under test, unless they are single coil types.

—E. C. Manifold, VK3EM.

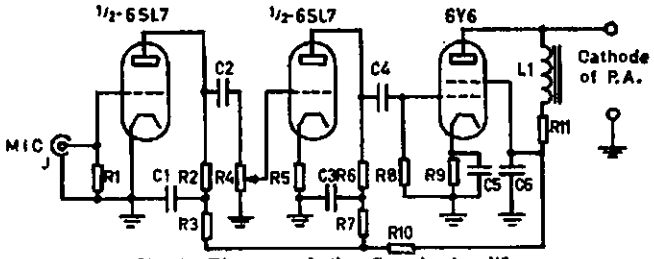
A SIMPLE SERIES-CATHODE MODULATOR

THE modulator circuit shown is capable of modulating any transmitter up to the maximum power limit, to about 80 per cent. with low distortion. It requires no power supply other than the heater power for the tubes, since it gets plate power from the cathode circuit of the r.f. amplifier with which it is used. Although the modulator output is connected in series with the r.f. amplifier cathode, the modulation is essentially of the grid-bias type. A useful characteristic of the system is that it does not require a fixed source of grid bias for the amplifier.

The speech amplifier uses a high-mu double triode to give two stages of resistance-coupled amplification. This gives sufficient gain for a crystal microphone. Resistors R3, R7 and R10, together with C1 and C3, provide de-coupling and additional filtering of the d.c. obtained from the r.f. amplifier cathode circuit.

The output stage uses one or more 6Y6s in parallel; in determining the number of tubes required to modulate a particular amplifier, use one 6Y6 for each 200 mA. of amplifier plate current based on the operating conditions for c.w. work. The audio output voltage is developed across L1 and R11 in series. R11 may be omitted if the d.c. voltage between the screen and cathode of the 6Y6 does not exceed the rated value of 135 volts.

No special constructional precautions need be observed in laying out the amplifier. The unit can be built on a home-made chassis or a standard chassis may be used instead. A filament transformer may be included in the unit in case the heater power cannot conveniently be obtained from the transmitter itself.



Circuit Diagram of the Speech Amplifier and Modulator.

C1, C3, C8—8 μF. electrolytic, 450v.
C2—0.005 μF., 400v.
C4—0.01 μF. 400v.
C5—50 μF. electrolytic, 50v.
R1—2.2 megohms, ½ watt.
R2—0.22 megohm, ½ watt.
R3, R7, R10—22,000 ohms, ½ watt.
R4—0.5 megohm volume control.
R5—2,200 ohms, ½ watt.
R6, R8—0.1 megohm, ½ watt.
R9—50 ohms, 2 watt (see text).
R11—2,000 ohms, 2 watts (see text).
L1—Small filter choke, "a.c.-d.c." type satisfactory.

To use the modulator, first tune up the transmitter for ordinary c.w. operation with the modulation unit disconnected. Then connect the modulator output terminals in series with the amplifier cathode as indicated in the circuit diagram. (Make certain that the modulator cathodes are up to operating temperature before applying plate voltage to the r.f. amplifier).

The amplifier plate current should drop to approximately one-half the c.w. value. If the plate current is too high increase the value of R9 until it is in the proper region; if too low, decrease the resistance at R9. Once this adjustment is made, the system is ready for phone operation. The r.f. amplifier plate current should show no change with speech input, except for a slight upward kick on voice peaks.

The carrier power output with this system is somewhat less than would be obtained with conventional grid modulation because the d.c. voltage drop in the 6Y6 modulators subtracts from the amplifier plate voltage. The difference is small with r.f. tubes operating at 1,000 volts or more.

Your scribe used, instead of the 6SL7 and 6Y6G, a 12AX7 and 6V6GT and the results were very favourable. L1 became an old speaker transformer, the secondary of which became a good monitor. Apart from these alterations, the circuit is exactly as shown.

—David Priestley, WIA-L3163

[Although the author is not licensed, he built this unit in conjunction with VK3ANM, and based it on an article in the 1955 A.R.R.L. Handbook.—Ed. "A.R."]

A ZERO BIAS CLASS B LINEAR

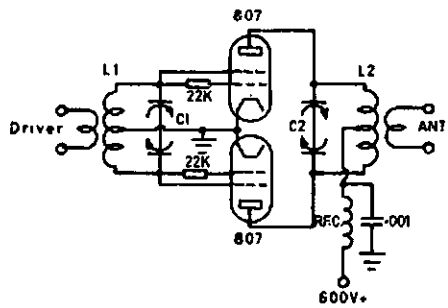
Many sideband operators in the past have found the linear amplifier a stumbling block with the generally stringent requirements as to bias and screen regulation. I decided to see how the zero bias class B 807 circuit[1], so popular as a modulator, would perform as an r.f. amplifier.

The circuit was constructed for 80 metres as per the schematic. Drive was from a 5763 class A stage from the d.s.b. output of a balanced modulator on 3.5 Mc. This output, while scarcely sufficient to drive the linear to its full capability, was adequate to show that the circuit really works.

Reference to the circuit will show that no screen bypasses are used; indeed if they were, the circuit would not work!

[1] "Amateur Radio," August 1960.

To tune up it is only necessary to feed carrier or sideband to the input and peak this circuit, the plate tank condenser is then peaked for maximum output. Standing plate current is, of course, very low (in the order of 5 mA. with 600v. applied).



L1—30 turns 30 s.w.g., 1¼ inch diameter, centre tapped. Driver link 4 turns of hook-up wire on top.

L2—30 turns 20 s.w.g., 2 inch diameter, centre tapped.

C1—Broadcast gang.

C2—Can be broadcast gang with half of the plates removed to double space.

The maximum plate current depends on the input signal, to a slight degree on the loading and, if you like, on how red you can stand your 807s (approx. 200 mA. at 600v.).

Efficiency appears to be about 70%, which compares with a theoretical 78.5% for class B. The anode supply should have fairly good regulation if this figure is to be realised. No neutralising was found necessary on 80 metres. ●

—Brian J. Warman, VK5BI

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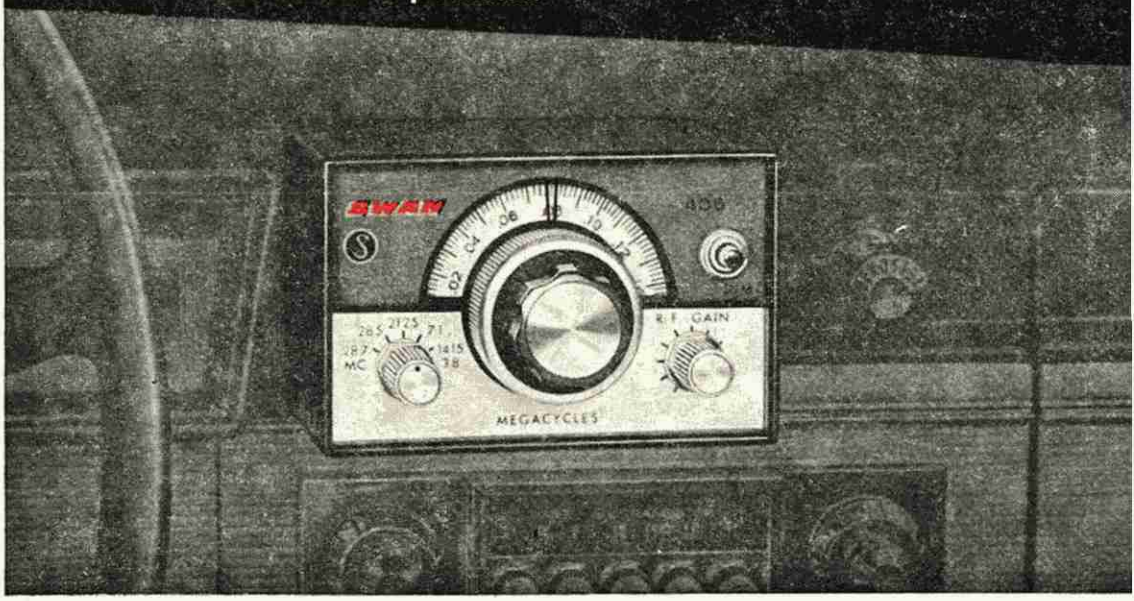
AMERICAN CALL BOOK

The Federal Treasurer, W.I.A., has for sale a £1 post paid recent back numbers of "Call Book Magazine." These, at less than half price, have been used by Federal Officers and most are in new condition. Apply Bob Boase, VK3NI, 50 Cardigan Street, Carlton, Vic. Only the edition listing American Amateurs available at present.

HERE IT IS! THE SPECTACULAR SSB TRANSCEIVER

Featuring the same unmatched performance, reliability and craftsmanship you have learned to expect from Swan Electronics. These units are now in production.



SWAN-406 MINIATURISED CONTROL UNIT

Miniature design for mobile mounting in conjunction with the Swan-400. May also be used for fixed station operation if desired.

- Phone Band Coverage as follows: 3.8-4.0, 7.1-7.3, 14.15-14.35, 21.25-21.45, 28.5-28.7, and 28.7-28.9 Mc. (These ranges can be easily adjusted to cover other segments if desired.)
- Direct reading dial scale calibrated in 2 Kc. increments. Dual tuning knobs provide choice of fast 6 : 1 ratio or slow 36 : 1 vernier tuning.
- Transistorised V.f.o. Circuit with Zener regulated power supply.
- Temperature Stability: Warm-up drift is virtually eliminated due to separation of the V.f.o. from the transceiver's relatively high temperature, and by the use of transistors. Oscillator circuit is fully compensated for wide excursions in ambient operating temperature.
- Voltage Stability: Zener voltage regulator completely isolates oscillator circuit from power supply variations. Input voltage can change plus or minus 50 per cent. with no change in oscillator frequency.
- Mechanical Stability: Extremely rugged construction and precision tuning system establishes new standards in operating smoothness.
- Includes receiver r.f. gain control; thus the 406 functions as a mobile control head, and makes it possible to install the Swan-400 transceiver in the trunk, if necessary.
- Compact size allows installation on the automobile dashboard within easy reach and visibility of the operator. Supplied with mounting brackets and hardware. Only 3" high, 4¾" wide, 5" deep, 3 lbs. weight.

SWAN-400 5 BAND 400 WATT

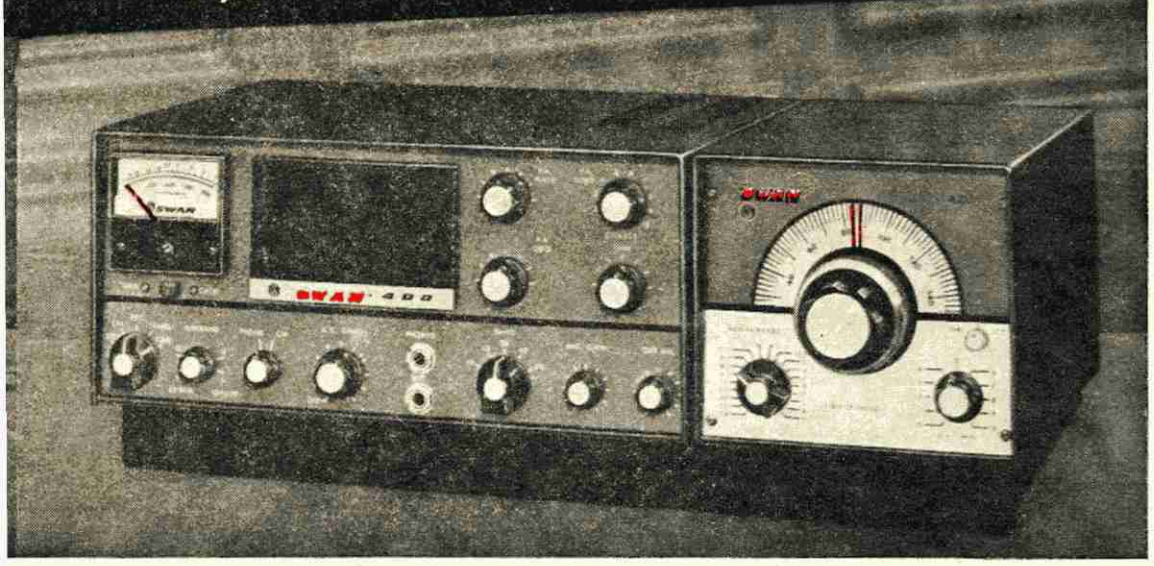
- Operates with the Swan-406 or 420 Frequency Control Unit, and the Swan-117B, 117AC, or 512 DC Power Supply.
- Covers the 10, 15, 20, 40, and 80 metre Amateur bands.
- Transmitter Power: 400 watts s.s.b., p.e.p. input, dist. prod. down 30 db. 320 watts c.w. input, 125 watts a.m. input. P.A. efficiency: 60 per cent.
- Two 6HF5 p.a. tubes, 6GK6 driver stage, 7360 bal. mod.; 17 tubes, total.
- Output Circuit: Wide range Pi Coupler, coarse and fine adjustment.
- Panel Controls: Function Switch Sideband Selector, Phone-C.W. Transmit Selector, Rec. A.F. Gain, Headphone Jack, Mic. Jack, Mic Gain, Carrier Bal., P.A. Tune, P.A. Grid, P.A. Load Fine-Coarse, Band Selector.
- Grid Block C.W. Keying. Key jack on chassis rear.
- Trans. Metering: 0-800 mA. P.A. Cath., and Grid Current position for over-modulation indicator.
- Provision for Plug-In VOX Accessory.
- High Frequency Crystal Lattice Filter. Common to transmit and receive circuits. 3 Kc. bandwidth. Unwanted sideband more than 40 db. down. Carrier down over 50 db.
- Overall audio bandpass: Essentially flat from 300 to 3,300 cycles, transmitting and receiving.

JUST THREE YEARS AGO Swan Engineering introduced the now famous SW-120/140/175 Single Band S.s.b. Transceiver. Our Company began as a one-man operation with Herb Johnson, then W7GRA, now W6QKI. In three short years we have grown to include a talented management team of 13 licensed Hams, and a top-quality production department. Our success would have been impossible without the tremendously enthusiastic support of Swan owners. We will continue our policy of providing the finest quality control and reliability, top dollar value, and customer service second to none. And now the latest development from the Swan laboratories. We think you'll agree that the Swan-400 is the most versatile, feature-packed Transceiver on the market, regardless of price.

WB6AWJ WA6EDJ K6HON WA6IVC WB6JBL W6KNV
W6OFT WA6OQY K6OUK W6QKI WA6YKZ WA6ZAC K6ZIK

NEW SWAN-400
5 BANDS - 400 WATTS

Separate frequency control heads for maximum stability and versatility, in fixed, portable or mobile operation. Read the following specifications, and we think you'll agree. — The new Swan-400 is for you.



SINGLE SIDEBAND TRANSCEIVER

- Single Conversion Design. Spurious emission and image response down more than 80 db.
- Receiver Sensitivity: Better than 0.5 μV. for 10 db. signal-plus-noise to noise ratio.
- Wide range A.G.C. System. S-meter functions automatically when receiving.
- 100 Kc. Crystal Calibrator.
- Built-in Speaker. Also provision for external speaker.
- 5½" high, 13" wide, 11" deep. 15 lbs. weight.

AUSTRALIAN DISTRIBUTORS—

W.F.S. ELECTRONIC SUPPLY CO.
225-227 VICTORIA RD., RYDALMERE, N.S.W.
Phones: 638-1715, 638-1355

Interstate Agents—

N.S.W.: **ATLANTIC RADIO**
36 Oxford Street, Woollahra — Phone 31-7811

Vic.: **ELECTRONIC SERVICES PTY. LTD.**
10b Douglas Street, Noble Park. — Phone 746-8446

South Aust.: **TELEVISION & RADIOTRONICS**
12a Gays Arcade, Adelaide. — Phone 23-2474

West Aust.: **NEIL JAMES & CO.**
Barrack Street, Perth. — Phone 24-8961

SWAN-420 FULL COVERAGE FREQUENCY CONTROL UNIT

Designed for fixed station operation in conjunction with the Swan-400 S.S.B. Transceiver. May be installed for mobile operation if full frequency coverage is desired.

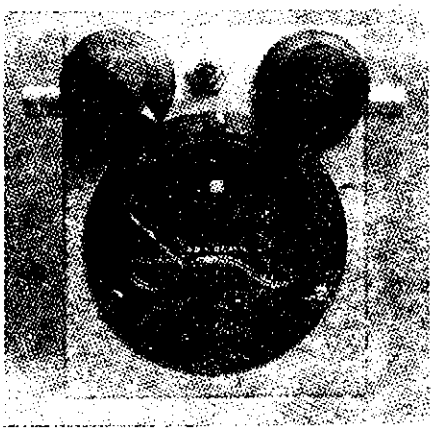
- Full frequency coverage of 10, 15, 20, 40, and 80 metre Amateur bands in **20 ranges of 200 kc. each,** including WWV range as follows: 3.4-3.6, 3.6-3.8, 3.8-4.0, 7.0-7.2, 7.2-7.4, 14.0-14.2, 14.2-14.4, 14.8-15.0, 21.0-21.2, 21.2-21.4, 21.4-21.6, 28.0-28.2, 28.2-28.4, 28.4-28.6, 28.6-28.8, 28.8-29.0, 29.0-29.2, 29.2-29.4, 29.4-29.6, 29.6-29.8 Mc.
- Direct reading dial scale calibrated in 2 kc. increments. Dual tuning knobs provide choice of fast 6 : 1 ratio or slow 36 : 1 vernier tuning.
- Transistorised V.f.o. Circuit with Zener regulated power supply.
- Temperature Stability: Warm-up drift is virtually eliminated due to separation of the V.f.o. from the transceiver's relatively high temperature, and by the use of transistors. Oscillator circuit is fully compensated for wide excursions in ambient operating temperature.
- Voltage Stability: Zener voltage regulator completely isolates oscillator circuit from power supply variations. Input voltage can change plus or minus 50 per cent. with no change in oscillator frequency.
- Mechanical Stability: Extremely rugged construction and precision tuning system establishes new standards in operating smoothness.
- Matches the Swan-400 in height, depth, and styling. Plugs directly into the 400. 5½" high, 6½" wide, 11" deep, 9 lbs. weight.
- Supplied with mounting base which joins the 400 and 420 in a neat tilt-up arrangement for desk top operating. (As illustrated above.)

A TRANSCEIVER CARRIER BALANCE INDICATOR*

E. H. MARRINER, W6BLZ

Why a tuned carrier null indicator? Too often, on a vacation trip with my s.s.b. transceiver, I received the report, "Say, your carrier's showing." This bothered me as there was nothing I could do about it until I got back home.

When you are using a transceiver there is no way you can listen to the receiver portion and check the carrier. Most portable transceivers just don't have provisions for a good null indicator. That's the story of how this little monitor gadget was born.



Front view of the carrier balance indicator. The sensitivity control is to the right and tuning to the left. The slug for L1 is above the meter.

All that has to be done after building this monitor is to slip it in series with the co-ax. line and balance out the carrier. It can also be used to check the output tuning and frequency. The advantage of a tuned indicator is to make sure that the residual signal from any spurious or mixing frequency does not give a false indication. An unwanted signal, even though it is attenuated considerably, can still show on the meter of an untuned indicator. By adding a tuned circuit, the gadget acting as a wave meter helps to make sure that the transmitter is inside of the band. It is very easy, with some exciters, to tune the transmitter to a mixing frequency which is outside of the Amateur band.

CONSTRUCTION

None of the parts are critical. The unit is constructed in a box measuring 3" x 3½" x 2". For exciters or low power s.s.b. transceivers up to 175 watts, the break-down voltage of the 68 pF. capacitor should be 600 volts. The meter is not critical, it can be a 0-1 mA. or a 0-5 mA.

* Reprinted from "CQ," November 1963.

TESTING

When the unit is finished, put it in series with the antenna co-ax. line and insert a little carrier while advancing the 2 megohm potentiometer. If the meter goes in the wrong direction, just reverse the 1N34 diode connections. After getting an indication, adjust the slug of L1 and peaking C2 for resonance with your 7 Mc. signal. (This can be used on any Amateur band by re-designing the L1 and C2 circuit.) After the monitor is tuned, balance out the carrier and advance the potentiometer for more sensitivity to get a good null indication.

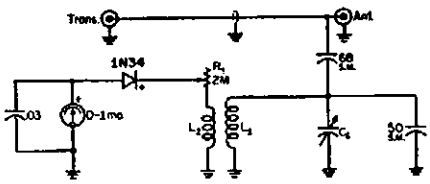


Fig. 1.—Circuit of the Tuned Carrier Balance Indicator for the 7 Mc. band. All capacitors are in pF. unless otherwise noted.

C1—11 pF. variable.
L1—20 turns No. 26 on 3/8 inch slug tuned former.
L2—3 turns hook-up wire on cold end of L1 (wound in same direction).

That is all there is to it! Next time you take a trip, don't be caught without this handy gadget. It's well worth the effort to build it. ●

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NEW CALL SIGNS

FEBRUARY 1964

VK1AU—C. G. Harvey, 18 Lynch St., Hughes, A.C.T.
VK2GF—G. R. Felser, 17 Ingalara Ave., Wahroonga.
VK2IN—R. C. Meadows, 80 Dampier Boulevarde, Killarney Vale.
VK2AET—Kogarah Evening College Radio Club, Regent St., Kogarah.
VK2ARN—W. H. R. Stitt, Station: Underwood St., One Mile Beach Forster; Postal: "Cumbijowa," Forbes.
VK2AXU—P. Maloney, 174 Excelsior Pde., Toronto.
VK2AXZ—W. A. Bell, 4 Bix Rd., Dee Why.
VK2AZF—A. J. McHugh, 30 Oliver Rd., Roseville.
VK2AZT—R. L. McHugh, 30 Oliver Rd., Roseville.
VK2ZGD—G. R. Connelly, 5 Hancock St., Bexley.
VK2ZHV—E. H. Vaughan, 75 Bynya Rd., Palm Beach.
VK2ZSW—K. W. Soward, Sidley St., Nimbin.
VK3ACZ—V. C. Zawalinski, 10 Regina St., Ringwood.
VK3OG—G. S. Samways, Cliveden Mansions, Wellington Pde., East Melbourne.
VK3PM—N. G. Williams, Station: Mildura Airport, Mildura; Postal: P.O. Box 457, Mildura.
VK3XS—E. R. Curtin, 112 Centre Dandenong Rd., Cheltenham.
VK3ZCM—A. E. Mensforth, 493 South Rd., Moorabbin.
VK3ZKE—K. J. Greene, 5 Blackshaw St., Ormond East.
VK3ZRY—R. L. Harrison, 1 Mary St., North Balwyn.
VK3ZUN—A. Lunstedt, 25 Lincoln St., Moe.
VK4OG—R. E. Gunnourie, 34 Gregory St., Toowong, Brisbane.
VK4YG—G. Yanow, 68 Victoria Park Rd., Kelvin Grove, Brisbane.
VK4ZHC—C. H. Hocking, 24 Shackleton St., Kedron, Brisbane.
VK6BZ—J. F. Buzerak, C/o. Datronics Engineering, 37 St. George's Tce., Perth.
VK6GL—L. E. Gooding, Darkan.
VK7WW—H. Harjono, Y.M.C.A., 55 Argyle St., Hobart.
VK9AD—J. R. Devereux, on board schooner "Matoma."
VK9RB—R. Hattersley, Norfolk Island.
VK9MJ—J. J. Mullen, Alexishafen, T.P.N.G.

SUBSCRIPTIONS DUE

All members of the W.I.A. are reminded that annual subscriptions are now due and should be paid promptly to their Divisional Secretary. Non financial members will not receive a copy of "A.R.," and back copies may not be available upon request. To preserve continuity of your files of "A.R.," please pay your annual subscription now.

VK-ZL-OCEANIA DX CONTEST, 1963, RESULTS

In presenting the results of the 1963 VK-ZL-Oceania DX Contest, the F.C.C. would like to thank all those who participated in the Contest and to congratulate the winners. In the overseas section the various band scores have not been indicated, only the overall totals.

Last year's Contest saw a considerable increase in the number of logs submitted and it is apparent that it is proving to be a very popular one, especially with overseas Amateurs. A number of overseas Amateurs commented on the increased activity in the VK-ZL area. (Some thought that it could have been better.) Several comments were received on the practice of the VK-ZL operators to use the whole of the bands instead of crowding into a small section of the band. The overseas Amateurs thought that this enabled them to make their contacts much easier and was quite a popular move.

The 1964 Contest will be organised by the N.Z.A.R.T., and the W.I.A. will be responsible for the Contest in 1965 when we will look forward to your company once again.

—Federal Contest Committee, W.I.A.

AUSTRALIA

C.W.—

Call	160 80/40	20	15	10	Total
VK1RD	135	—	—	—	135
VK2GW	2580	7460	2415	—	12455
2EO	4115	7860	—	—	11975
2RA	1450	6405	1850	—	9705
2APK	1180	3920	1910	—	7010
2QL	1870	1320	220	55	3465
2VN	110	2480	665	—	3255
2XU	—	3115	—	—	3115
2YB	1140	1645	190	—	2975
VK3DQ	2695	3370	730	—	6795
3AXK	2060	3195	855	—	6110
3YD	—	5200	—	—	5200
3RJ	1700	2095	805	—	4600
3XB	2910	420	400	—	3730
3QP	1690	1350	—	—	3040
3ARX	—	2155	110	—	2265
3QV	—	—	615	—	615
VK4SD	—	5995	—	—	5995
4LT	—	4555	605	55	5215
4CK	—	2210	215	—	2425
4SN	—	110	2025	—	2135
4SS	—	—	1510	—	1510
4JB check					
VK5ZP	5075	8135	2915	—	16125
5WP	—	2225	300	—	2525
5RX	—	1345	—	—	1345
5KO	650	—	—	—	650
5JT	210	120	165	—	495
5JE	420	—	—	—	420
VK6RU	2250	7230	2965	165	12610
VK7SM	1475	3555	575	—	5605
7RY	—	575	—	—	575
VK9RG	605	1495	1365	—	3465

Band Leaders—C.w.

160 Metres:	VK5KO	55	points
80 Metres:	VK2QL	810	,,
	5KO	430	,,
	5JE	420	,,
40 Metres:	VK5ZP	4965	,,
	2EO	3850	,,
	3XB	2910	,,
20 Metres:	VK5ZP	8135	,,
	2EO	7860	,,
	2GW	7460	,,
15 Metres:	VK6RU	2965	,,
	5ZP	2915	,,
	2GW	2415	,,
10 Metres:	VK6RU	165	,,
	2QL	55	,,
	4LT	55	,,
All Bands:	VK5ZP	16125	,,

PHONE—

Call	160 80/40	20	15	10	Total
VK2AHT	1235	6650	1285	—	9170
2APK	—	2845	990	—	3835
2KM	—	3305	—	—	3305
2AKV	—	1085	210	—	1295
2RA	—	430	55	—	485
VK3TL	725	4975	620	—	6320
3QV	—	—	1170	—	1170
VK4DD	—	4260	—	—	4260
4LT	725	3470	420	—	4110
4UK	—	1085	—	—	1085
4XJ	940	—	—	—	940
4SN	—	—	810	—	810
4PJ	—	50	150	—	200
VK5FT	—	265	—	—	265
5WP	—	2225	300	—	2525
VK6RU	110	6370	1595	55	8130

Band Leaders—Phone

160 Metres:	Nil		
80 Metres:	VK3TL	165	points
	6RU	55	,,
40 Metres:	VK2AHT	1235	,,
	4XJ	940	,,
	3TL	560	,,
20 Metres:	VK2AHT	6650	,,
	6RU	6370	,,
	3TL	4975	,,
15 Metres:	VK6RU	1595	,,
	2AHT	1285	,,
	3QV	1170	,,
10 Metres:	VK6RU	55	,,
All Bands:	VK2AHT	9170	,,

RECEIVING—

WIA-L2033	740	points
WIA-L3183	5060	,,
WIA-L6021	8205	,,
WIA-L6005	1520	,,
BERS-195	7030	,,

NEW ZEALAND

C.W.—

Call	160 80/40	20	15	10	Total
ZL1AH	2340	8025	3050	—	13045
1ARY	265	4515	1405	—	6185
1AIX	—	4295	805	—	5100
1WW	3345	—	—	—	3345
1HY check log					
ZL2AWJ	4480	4105	755	—	9340
2AYJ	2565	5340	810	—	8715
2ASM	55	4440	525	—	5020
ZL3VW	—	3220	—	—	3220
3VI	520	2400	—	—	2920
3IS check log					
ZL4BO	2445	—	—	—	2445
4JF	—	300	—	—	300

Band Leaders—C.w.

80 Metres:	ZL2AWJ	380	points
40 Metres:	ZL2AWJ	4100	,,
	1WW	3345	,,
	2AYJ	2565	,,
20 Metres:	ZL1AH	8025	,,
	2AYJ	5340	,,
	1ARY	4515	,,
15 Metres:	ZL1AH	3050	,,
	1ARY	1405	,,
	2AYJ	810	,,
10 Metres:	Nil		
All Bands:	ZL1AH	13045	points

PHONE—

Call	160 80/40	20	15	10	Total
ZL1AIX	2180	6220	2505	—	10905
1AAS	—	4430	—	—	4430
ZL4OG	—	480	—	—	480

Band Leaders—Phone

80 Metres:	ZL1AIX	910	points
40 Metres:	ZL1AIX	1270	,,
20 Metres:	ZL1AIX	6220	,,
	1AAS	4430	,,
	4OG	480	,,
15 Metres:	ZL1AIX	2505	,,
10 Metres:	Nil		
All Bands:	ZL1AIX	10905	,,

RECEIVING—

ZL149	7310	points
ZL282	2770	,,
RA3081	1140	,,
ZL359	165	,,

OVERSEAS

C.W—

North America

W1UUK	456	pts.	
W3AFM	342	,,	
W3VKD	288	,,	
W3MCG	263	,,	
W3GHD	32	,,	
K4VWH	432	,,	
W5WZQ	4400	,,	
W5BUK	934	,,	
K5JZY	639	,,	
K5JVF	459	,,	
W5KC	315	,,	
W6LDD	5890	,,	
W6MSM	3614	pts.	
K6IEC	3200	,,	
W6IRJ	2	,,	
W7POU	370	,,	
W7BTH	288	,,	
W7DJU	160	,,	
K8VDV	2286	,,	
W8GQU	440	,,	
K8NMG	270	,,	
W0YCR	973	,,	
K0FCR	690	,,	
W0SNX	638	,,	

South America

HK7YC	238	pts.	
HK7UL	33	,,	
PJ2AE	280	,,	
PY1ADA	44	,,	
PY2BZD	42	pts.	
PY4AYO	8	,,	
YV6BS	2	,,	

Europe

DJ1JM	6	pts.	
DJ1VI	2	,,	
DJ8IF	40	,,	
DL7AA	2185	,,	
DL7BK	390	,,	
DL8DX	161	,,	
DM2TAD	240	,,	
DM3ZDA	18	,,	
DM3EN	14	,,	
DM4WPL	64	,,	
F2PO	24	,,	
F8TM	208	,,	
G4CP	1365	,,	
G3FXB	1274	,,	
G5WP	1260	,,	
HA1KSA	896	,,	
HA1ZH	8	,,	
HA8KCI	2	,,	
HB9DX	44	,,	
IT1AGA	1	,,	
OH1TN	1110	,,	
OH1SH	1001	,,	
OH2BC	495	,,	
OH2BR	370	,,	
OH5UX	184	,,	
OH5UQ	8	,,	
OH3XZ	24	,,	
OH3TA	18	,,	
OH2OG	3	,,	
OK1ZL	549	,,	
OK1LM	480	,,	
OK3OM	430	,,	
OK2KJU	405	,,	
OK1AVD	259	,,	
OK2BBJ	231	,,	
OK3MM	220	,,	
OK1AFC	182	,,	
OK3KLM	80	pts.	
OK1US	75	,,	
OK2FN	70	,,	
OK1VB	33	,,	
OK1AEV	18	,,	
OK2QX	18	,,	
OK3IR	14	,,	
OK3CDP	12	,,	
OK3UH	8	,,	
OK3CEH	8	,,	
OK2ABU	4	,,	
OK1XM	2	,,	
OK1AGM	2	,,	
OK3KGI	1	,,	
ON4FU	902	,,	
ON4LX	726	,,	
OZ3FL	294	,,	
PA0LOU	333	,,	
PA0VB	120	,,	
PA0JWL	8	,,	
SL6BH	192	,,	
SM5CCE	1067	,,	
SM3TW	256	,,	
SM7QY	210	,,	
SM5BEU	186	,,	
SM5BVF	88	,,	
SP5YC	156	,,	
SP2IU	66	,,	
SP8ADU	24	,,	
SP8AOV	6	,,	
YU1BCB	429	,,	
YU1BKL	176	,,	
YU2AKL	68	,,	
YU4JOP	120	,,	
YU1SJ	18	,,	
YO6AY	2	,,	

(Continued on Page 15)

Asia

HL5X	14112 pts.	JA3CKB	256 pts.
JA1UX	6534 ,,	JA3YBQ	203 ,,
JA1ELX	2304 ,,	JA3FIP	160 ,,
JA1EM	2109 ,,	JA4AQR	312 ,,
JA1HGY	2106 ,,	JA4FW	288 ,,
JA1IFP	522 ,,	JA4CH	105 ,,
JA1BEB	240 ,,	JA5FQ	1712 ,,
JA1CUM	186 ,,	JA6PY	1392 ,,
JA1HLR	112 ,,	JA6AKW	138 ,,
JA1DFQ	105 ,,	JA6PL	16 ,,
JA1BUI	48 ,,	JA7AD	6390 ,,
JA1CJU	40 ,,	JA7MN	737 ,,
JA1EFE	30 ,,	JA7DK	729 ,,
JA2DN	576 ,,	JA7JI	488 ,,
JA2WB	558 ,,	JA8BB	630 ,,
JA2ANX	320 ,,	JA8AJM	180 ,,
JA2BVS	24 ,,	JA0AC	1120 ,,
JA2PY	24 ,,	JA0XD	162 ,,
JA3DBO	1218 ,,	YA9KXA	10 ,,
JA3EGE	280 ,,		

U.S.S.R.

UA1TL	6 pts.	UB5KED	344 pts.
UA3TV	90 ,,	UB5MZ	210 ,,
UA3TA	8 ,,	UC2AR	114 ,,
UA4PW	168 ,,	UC2AW	18 ,,
UA4SM	72 ,,	UD6DU	52 ,,
UA5AA	864 ,,	UD6KAF	40 ,,
UA6KAF	18 ,,	UH8KAA	12 ,,
UA9VB	1666 ,,	UH8BO	1 ,,
UA9WC	44 ,,	UL7KBK	192 ,,
UA0FE	1617 ,,	UL7CH	12 ,,
UA0SH	405 ,,	UM8KAA	672 ,,
UA0EH	336 ,,	UT5HP	40 ,,
UA0GF	200 ,,	UW4HW	60 ,,

Oceania

KH6EPW	13916 pts.	VR2EH	3146 pts.
W8KWC/KH6	1710 ,,	VR2EM	2030 ,,
VR1B	670 ,,	ZK1AR	6370 ,,

Africa

ZS6LW	16 pts.	5A5TW	100 pts.

PHONE—

North America

W3JNN	392 pts.	K8ERV	2400 pts.
W3GHD	2 ,,	K6AHV	85 ,,
W4RLS	684 ,,	W7BTH	24 ,,
W4JIN	256 ,,	K8WVF	136 ,,
W4HOS	52 ,,	K9ECE	38 ,,
K5MDY	780 ,,	K0FCR	330 ,,
K5JZY	65 ,,		

South America

KP4RK 57 pts.

Europe

I1TAI	270 pts.	OH5TM	32 pts.
I1AMU	224 ,,	SL6BH	30 ,,
OH2PM/1	408 ,,	SM5LL	488 ,,
OH2BC	60 ,,		

U.S.S.R.

UA1MU	343 pts.	UA0EH	405 pts.

Asia

6N5X	10166 pts.	JA3BBG	70 pts.
JA1HGY	175 ,,	JA3DAY	32 ,,
JA1BUI	84 ,,	JA4BPO	198 ,,
JA1INJ	60 ,,	JA4ACH	16 ,,
JA1EL	24 ,,	JA6PY	360 ,,
JA1WA	3 ,,	JA6PL	156 ,,
JA2ADH	434 ,,	JA7DK	198 ,,
JA2BGW	368 ,,	JA0AC	350 ,,
JA2ANX	65 ,,	JA0SU	70 ,,
JA3CHQ	684 ,,		

Oceania

FK8BB	456 pts.	KR8OF	2 pts.
KC6BO	1544 ,,	VR2BZ	686 ,,
KH6EPW	1377 ,,	ZK1AR	3780 ,,

RECEIVING—

Europe

HA5-055	252 pts.	OK3-9280	560 pts.
SWL-HE9FMO	416 ,,	SM4-3415	80 ,,
OK1-7453	210 ,,	SM5-D61	126 ,,
OK2-15037	2892 ,,		

North America

K2-7079 24 pts.

Asia

JA1-3499	2024 pts.	JA5-1231	280 pts.
JA3-2325	84 ,,	JA9-1166	2 ,,

The Publications Committee Reports . . .

Correspondence was received from the following during the period ending 11th May, 1964: VKs 5MC, 2AXY, 2AOU, 4XP, 3AIK, 8KK, 3AU, 4NS, 2AAK, 3AAW, 2ON, 3ALZ, 4ZRH, 3ARF, 3ANG, 3AVA, 2DM, 7ZBH, 7ZAS, 6NJ, 4RW, 1KM, 3AHG, 2AKX, 5BB, 5ZCR, L3042, L3006, L2280, J. W. Miles, S. E. Widgery, P. Garde, and D. Gilder.

A formal reply will be sent those correspondents where this is also required.

At the May meeting the new '64/'65 Call Book was discussed and it was agreed that the price would remain as before. Supplies are expected within the next three months and should be available some time in July on present indications.

The layout of the current Log Book was discussed and it was agreed that the newer vertical style be adopted as a trial and user's comments would be awaited.

Four new technical articles were received, but as these are still less than our needs, it was agreed that "A.R." would republish various technical articles from other magazines. This does not suit all readers, particularly those who have access to other overseas magazines, but it was thought that many Amateurs who do not receive other magazines did welcome the opportunity to read these reprinted articles.

The Prediction Charts have not been commenced as the Committee await all States to agree to certain proposals submitted at the last Federal Convention. When these are ratified it will be possible for your Committee to allocate more funds to printing "A.R." It is the current lack of finance which has temporarily reduced the size of "A.R."

The Committee expressed their gratitude to those who have volunteered to assist in doing the required drawings for the magazine. In addition, it was reported that to date no suitable volunteer had been found to act as sub-editor for the temporarily discontinued Sideband Page. Some correspondents are overlooking the fact that all notes must be received by "A.R." on or before the 8th of the month preceding publication, late arrival of the notes means their omission from "A.R." In this issue all notes received were published and any missing notes indicates that they had not been received or were sent in too late for publication.

The Publications Committee will print in this column each month the main points regarding Magazine happenings so that you, the reader, will be fully aware of the facts. Comments are invited upon the introduction of this column.

Book Review

THE TRANSISTOR RADIO HANDBOOK

The first edition of this handbook by Donald L. Stoner and L. A. Earnshaw, two world famous Hams, is published by Editors & Engineers Ltd., a name famous for many years for their "Radio Handbooks". The book under review upholds the high reputation already held by this group and presents the subject in a manner that can be clearly and easily understood by the average Amateur.

Whether you wish to make a simple transistor gadget or a single sideband exciter does not matter. You can find them in this book. The sort of volume that has been needed by the Electronics Industry for some time. A volume which strips the transistor of its mystery and high-falutin maths. and presents its subject in an easily understood manner.

Price 63/6 plus 1/9 postage. (If you think this dear, try pricing some of the other texts.)

Our copy from McGill's Authorised Newsagency, 183-185 Elizabeth St., Melbourne.

A.R.R.L. 1964 HANDBOOK

For thirty-five years the A.R.R.L. has issued the "Radio Amateur's Handbook," and during this period they have adopted a standard style of layout. Each year they add or substract to its contents, depending upon the current trend of Amateur Radio in the U.S.A. This book is a very valuable reference source and does provide the basic theory and practical aspects of Amateur Radio.

In twenty-five chapters it deals very thoroughly with the average Amateur's needs, but due to the higher power permitted for U.S.A. transmitters the book is biased towards such high power rigs. This, however, is only a minor point as the average reader will realise that the final p.a. can be omitted and so provide a rig suitable for Australian conditions.

Every Amateur should have a copy of the A.R.R.L. Handbook and if your edition is many years old, then the current issue is a good buy at 51/6 each. It is one of the cheapest books of its type available and will remain an asset for many years to come.

Our copy from McGill's Authorised Newsagency, 183 Elizabeth St., Melbourne, Vic.

RESULTS OF THE 1963 SP (POLISH) DX CONTEST

Australia:	C.W.	VK3AHQ	119 pts.
New Zealand:	C.W.	ZL1HY	15 pts.

No other entries were received from the Pacific area.

S W L

Sub-Editor: Ian Woodman, WIA-L3006

Those persons supplying notes to this section should note that the new sub-editor for this section will be Chas. Aberneathy, WIA-L2211, and all mail for this column should be sent to him by 30th of month at 30 Urunga Pde., Miranda, N.S.W.

TWO S.W.L. AWARDS

We now have the details of two s.w.l. awards which are available to you. These awards have the approval of Federal Executive, who are supplying the attractive certificates. The awards are Heard All VK and S.W.L. D.X.C.C. The requirements for these awards are as set out below.

The Heard All VK award requires one card from each of the following areas: VK1, VK2, VK3, VK4, VK5, VK8, VK7, VK8, VK9 (New Guinea), VK9 (Papua), VK9 (Nauru or Norfolk), VK9 (Cocos Keeling or Christmas Island), VK0 (Heard Island or Macquarie Island), VK0 (Antarctica). A total of 14 cards in all for this award.

The S.W.L. D.X.C.C. award requires one QSL card from 100 different countries; these countries as per the W.I.A. list of separate countries status. A total of 100 cards for D.X.C.C.

For each of these awards it does not matter what mode of reception was used, but it must be from an Amateur station. The information on the card should include the date, time (either G.M.T. or E.A.S.T.), frequency, mode and station worked or CQ. Zones do not enter into either award and they must be post-war QSL cards. These awards will be issued to overseas S.w.l's. as well as VK members. The awards manager is Eric Trebilcock, WIA-L3042, 340 Gillies St., Thornbury, N.17, Victoria.

NEW SOUTH WALES

If the mail to this QTH continues I am afraid that the heading of N.S.W. shall have to be changed. To my great pleasure letters have reached me from VK2, 3, 4 and 5. This is very encouraging, and I extend sincere thanks to those who have given a little of their time to pen a few lines. For those s.w.l's. who do not have a b.f.o. on their rx we have a circuit of a very simple unit which can be added to your set. A copy plus an explanation can be yours for the asking. Also available is a time conversion chart. When applying, please enclose a stamp for postage. Our thanks go to Sid L2256 (President of the VK2 Group) for the above two items, as a lot of time went into the drawings which are a credit to him.

Don L2022 has not done much listening this year to date, but shall have something for us in the near future. Ross Beckley finds the s.w. b.c. side of s.w.l'ing interesting and has to his credit 48 countries, 49 stations, with 26 confirmations. Congrats. on passing the A.O.C.P. exam. Roger L2281 listens on a d.w. set with a 70 ft. long wire, and has logged K2, K7, KH6, ZL, etc., on 14 Mc. Sid L2258 received on 14 Mc. s.s.b.: HB9, G3, UD5, 4X4, VS6, UA9, CR9, 9M2, YV and FO8. Quite a nice variety. Ross L2233/VK4 heard on 14 Mc.: W4, LU9 and ZL8. Robert Schwartz is a new member in VK2; we offer a hearty welcome to you. Chas. L2211 has again received the Elizabethan Award.

VICTORIA

Maurie L3055 is having rx trouble, which he hopes will be rectified soon; the trouble is not affecting his DX listening. Noel L3101 reports that from 1960 he has made 1,000 entries in his log book, sent our 500 reports and received a return of over 300 cards. He has heard 9N1, VS4, SM5, VK0. Harry L3102 is hoping to try the 52 Mc. band at a later date. I think you shall enjoy the openings on that band. Let us know of your progress.

QUEENSLAND

Chas. L4018 uses an Eddystone 640 rx with a G5RV antenna. Hope you enjoy the booklet Chas. Lew L4020 in the Brisbane area has a modified d.w. rx and has logged G5, G3, HC, 4X4, ZK, F and JA—nice going Lew. Bill L4001, during March, received on 14 Mc.: UA, CE, DJ, KL7, HL9, FO8, G5, XE, JA and W5—quite a nice haul. Pleased you found the aerial booklet of interest.

SOUTH AUSTRALIA

Alan L5065. Yes, it is pleasing to know that at least there is one active S.w.l. in VK5. Alan uses a d.w. and a nine-tube rx. On 14 Mc. he heard F, I1, M1, UA, UB, SM, HB, G, G1, GM, DJ. Very good and thanks for your letter. 73, Chas. L2211.

DX LADDER

	Countries		Zns.	S.s.b.		W
	Conf.	Hrd.	Conf.	Conf.	Hrd.	Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	274	38	20	104	35
P. Drew	94	237	30	44	200	27
A. Westcott	93	159	31	9	107	11
M. Hilliard	87	241	33	34	169	12
M. Cox	83	233	30	51	165	21
C. Aberneathy	58	101	31	—	—	—
N. Harrison	52	158	29	18	54	36
G. Earl	52	150	26	32	127	6
I. Thomas	42	139	20	16	97	14
R. Beckley	27	47	19	—	—	—
R. Oats	9	26	8	—	—	—

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the

EDITOR "A.R.,"
P.O. BOX 36,
EAST MELBOURNE, C.2,
VICTORIA.

YOUTH RADIO CLUBS

Special congratulations this month to Bob 5OD, who is the new Y.R.C. supervisor for VK5. He is the founder of the well known "Open Door Radio Club" which has been part of Methodist Youth work for some years. This is great news, Bob. If you can organise help from the Division, you will get some club leaders who would otherwise feel snowed under before they started. Details of this Divisional help will be eagerly awaited.

There is also a new supervisor in VK6—a good type, obviously, because he wrote me a letter! He is Lawrence Jessop, 6ZEA, a teacher at Wesley College, Perth, where he organises a very active club. There is a call sign 6ZEW but no suitable gear—did I hear somebody in VK6 with some suggestion? The club is distinguished by having two members who recently passed L.A.O.C.P.—Ray Godley, 6ZEG, and Peter Pemberton, 6ZEP. I hope they inspire others in VK6 to make the effort.

There are now further details from the Booragul High Y.R.C. As well as Susan Brown, our first school girl A.O.C.P., there were two others in the January exams.—Jan Oosterveen and Ross Beckley. This makes four from the Keith Howard stable—worth an Oscar (Hollywood type). The total of new Amateurs from Y.R.C. now stands at 10 on my count. In such a short time, this result clearly indicates what could be done with full backing. This is so obvious that one should not be surprised at our next piece of news—

The Federal Secretary of the W.I.A. has received a letter from the Radio Society of Great Britain, asking for details of the Australian Youth Radio Clubs and indicating that a similar project is being considered in U.K. They have the same great need to provide a worthwhile challenging hobby for their youth, and even in a country where a great deal more commonsense is used in improving scientific education than in this country, every little bit helps. Also, the U.K. Amateur numbers situation may be something like ours. Compared on a ratio basis with the 250,000 U.S. Amateurs, Australia should have 12,500 Amateurs instead of the present 3,000. You should all do your bit in educating local M.H.R's. in the fact that a minute fraction of Sir Robert's £5½ million for science education or, even easier and cheaper, the granting of novice licences, would encourage many more people to study our branch of electronics.

Chas 4UC showed a fine touch in publicity when he put the Clontarf High School Y.R.C. on the air (VK4RP) recently. He managed photos in two papers, several minutes on A.B.C. television, and several columns in the dailies, as well as the presence, at the opening, of the Assistant Director of Secondary Education, the Mayor of Redcliffe, and some 50 parents. This is publicity of the best kind—other club leaders can aim towards this gathering of goodwill for a good cause. Chas. was backed up by Alf 4OL at 4WI and about 40 odd contacts, which is very good for an afternoon effort. Our local Y.R.C. members, Roger 1RD and Jim 1JR, managed a contact. A tx for your Y.R.C. makes a great magnet, as Chas. has shown. If you are a club leader without licence or gear, you would profit greatly if you make a great effort to interest your Division or the local Amateurs in providing regular opportunities for youngsters to be excited by talking over the air.

I had a very encouraging talk with ex-Y.R.C. George 1GB, who is now at Australian National University. He is most emphatic that his A.O.C.P. studies have helped him considerably in his first-year physics, especially in experimental work where there are so many electronic methods. Club leaders should remember this, while still insisting that all-round academic results get the scholarships. Electronics study must do good—excessive operating or aimless "messing about" must be avoided in final high school year, except in ordinary spare time. 73, IKM.

— . . . —

NAURU ISLAND

VK9WP will be operating from this rare spot for the next two years. He expects to reach the island in June and will use both c.w. and phone. (He has a "Panda" transmitter.) QSL via the VK3 Bureau.

—L3042/BERS195.

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub-Editor: A. H. BEHENNA, VK5BB,
36 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Before I start this month's notes allow me to make it known that all DX notes for each month must be in the Editor's hands on the 8th of the month preceding the actual issue date. A moment's reflection on this will convey that approximately three weeks has elapsed from the time they leave this typewriter until they find their way into your letterbox. Therefore some hot DX news cannot be included in the month's publication.

For the very keen boys the bands are still offering quite good contacts and with the trough at our back door, Ken 3TL advises he has just had his best month ever. Shift workers and the lucky retired who used 14 Mc. during the afternoon are now getting up to two or three hours of uninterrupted contacts.

VK3AC/Mobile heard just below 7.1 Mc. with GI, GW and G2 on the hook all at once. Not bad for mobile s.s.b.

Graham has returned from Norfolk, with his antenna (a wyndom) reported up around the 100 ft. mark, reports noise level very low, and worked some European DX. There were many pile-ups although contacts appeared a little spasmodic, plus the fact of one blackout. Multi-band vertical for 14 Mc. was used.

W5WVX/MM, aboard the U.S. Gridley, has arrived in VK for the Coral Sea Celebrations, with operator Lefty kept very busy working the local boys.

The workings of all contributors will in future be grouped in the respective bands to conserve space and to keep the reporting more uniform.

160 Metres: No reports on this band at all. Please, a list from someone!

80 Metres: VP8GL worked on c.w. and a.m. QRN still heavy, but should improve in the next few weeks.

40 Metres: Heard at good strength are G, GW, GI on most afternoons around 7.1 Mc. 0630z, whilst some mornings around 2130z some of the near middle east countries can be had, try 7045 Mc. This reference to s.s.b.

20 Metres: Fairly lively during the p.m. hours although after the sun sets the band appears to have passed out and the noise level is very high.

Some stations worked: UA0KJA (0800), W6JRY (0445), SP7HX (1330), UA0KKA (1200), KR6FN (1200), JA, etc., all on a.m.

W0-W1, UD6KAR (1300), IT1TAI (1315), KP4AAQ (0630), VK0GS (0745), UA0EK (1230), VK2AGH (L.H.I., 0330), VE8AH (0730), CO2AH, CT1KT, FB8ZZ, GB3RAF, HM5BF, HZ2AMS/HZ4, JT1CA, M1AC, KV4CF, OX3JV, PY4BEX, SL2AD, TG9RJ, VP1TA, VP3HAG, VP6KL, VP8BFC (Chagos), VS9AAA, YN6RD, ZC5AJ, ZP5DD, 5A5TW, 9A1ZG. The above all s.s.b. KN7ZBV and CR7AD on c.w.

15 Metres: W6 and JAs on a.m. and improving to west coast 0105z. KR6, JA, W on s.s.b.

10 Metres: Ron 5GM reported working JA on this band. VK8KK also says he has heard them.

All times quoted are in G.M.T.

QTH CORNER

M1AC—Via K8UZA.
OX3JV—Via SM7ACB.
VP1TA—Box 200, Belize, British Honduras.
9A1ZG—Via DJ1ZG.
AP2AD—Ahmed Ebrahim, P.O. Box 4074, Karachi.
BV1USG—Mars Station, A.P.O. 83, San Francisco, California.
CE1FW—Ismael Nunez, Casillo 192, Copiapo.
CO1TA—Escuela Tecnica Aeronautica, Base San Julian.
CN8BB—Roger Davize, Immeuble Consulat De France, Marrakech.
CP4DB—M. Antonio Carbaga, Hoyos 40, Potosi.
CR4AX—Alaor Gouveia, Sal Airport, C.V.I.
CX1TD—Beatriz A. De Riet, 25 de Mayo 47, Rocha, Rocha.
DJ0AA—G. V. Haylock, Via G2DHV.
EA9AP—Adolfo P. Real, Gral, Marina 24, Melilla.
F3KT—Francois Aguila Fils, Via FA3KT.
HK7AJ—Heriberto Munoz O, Casa Cural, La Paz, Boyaca.
I1SCN—Bernado Scinia, Castel Dell Ovo, Napoli.
JA6AJX—K. Jinnai, 1660 Goi, Kurume.
OD5BX—Antranik Tony Taoukjian, P.O. Box 1656, Beirut.
OH8QL—Perrti Dalstrom, Laanila 3, Oulu.
TG9MQ—Mario A. Mazariegos C, Apto 115, Guatemala City.
VE4GM—Alvin G. Goranson, Lundar C.
5U7AA—Pierre Boya, Entreprise de Benin, Niamey.
9N1MM—Rev. Marshall D. Moran, P.O. Box 50, Kathmandu.
9Q5AN—Elie Levy, P.O. Box 2537, Elizabethville, Katanga.
5R8SR—Chef de Service Radio, Post and Telegraphs, Tananarive.
4X4LS—Oved Ben-Aroya, Even Yehuda.

Country names to follow the above addresses.

Best QSLs reported this month: YN3LBV, UD8KAR, PY2JU, UH8AA, 6O1KH, BV1USG, SU1IM, YN6RD, VS9HAA, VQ4IN/VS9H, CR-8AD.

Once again a further plea to those that are interested in 160 and 80 metre bands DX wise. Would 5KO like to send a rough list of his exploits? The undermentioned call sign is now on the air with a.m. and s.s.b., so if you feel disposed to call me any time or break in with some news, please accept this invitation, no matter how small your contribution. Special thanks to 5ZC, 3TL and 5ZK. I'll get around to writing my special thanks one day. 73, 5BB.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6RU	2	297	VK2JZ	61	210
VK6MK	43	291	VK3ATN	26	204
VK3AHO	51	284	VK4HR	12	192
VK4FJ	21	278	VK4RW	23	186

Amendments:
VK3ARJ 86 107

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	320	VK2AGH	71	259
VK3CX	28	303	VK3ARX	66	240
VK2QL	5	301	VK3AHQ	79	238
VK4FJ	29	296	VK3XB	75	235
VK3NC	19	282	VK3YL	39	231
VK6RU	18	259	VK5RX	23	230

Amendment:
VK3JF 70 195

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK4FJ	32	305	VK3NC	77	283
VK6RU	8	304	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	293	VK7LZ	23	242
VK6MK	74	293	VK4HR	7	233
VK3AHO	76	287	VK3BZ	4	231

Amendments:
VK2VN 18 230

ZS2MI – MARION ISLAND

"The three small archipelagos of Kerguelen Island (FB8XX), Marion Island (ZS2MI) and Prince Edward Island and the Crozets (FB-8WW) are individually and collectively the most barren tracts on the globe. Whether in their own latitude or in a higher one, except as lie in the Antarctic Circle itself. For no land, even in the north Polar area, presents such an impoverished vegetation"—so wrote J. D. Hooker in his memoirs on the botany of Kerguelen Island.

Marion Island was discovered in 1772—in 1777 Capt. Cook (yes, the same James Cook associated with Australian history) gave it its present name.

The island is 12 miles by 8 miles and was annexed and occupied on 29th December, 1947. The present weather station was established there in January 1948. The inhabitants of the island consist of four weather men, a medical officer, a radio technician and a radio operator.

Amateur Radio communication from Marion Island, using call ZS2MI was first established in March 1948, and its operation has been continued ever since. The tx runs 150w. into a rhombic beamed on Pretoria (South Africa). The rx's are AR88s, 1155s and HROs. Despite restricted Ham operation, a D.X.C.C. can be obtained within a few months.

Marion Island is continually swept by gales, and heavy seas pound its cliffs, with spray reaching up to 200 feet. Cloudless days are few and far between, and it rains on an average of 295 days out of 385.

The central peak on the island rises to 3,890 feet a.s.l. There is NO soil on the island, and the rock top is covered by peat, which is always soggy. All buildings stand on poles which are let down 15 feet onto solid rock and are linked by catwalks for the convenience of the men living there!

Seals, sea elephants, birds (50 species of the latter) frequent the island.

The above facts give some insight into a distant and very bleak island weather station, where although only seven men exist, Amateur Radio is "on their plate" in the form of ZS2MI (a call sign well known to lots of VKs)—just as it is allowed by the Australian Government for A.N.A.R.E. men who occupy the lonely Antarctica wastes and on Macquarie Island.

[Acknowledgment is made to the Durban Branch of the S.A.R.L., from whose newsletter "CQ", the aforementioned Marion Island information was taken.—L3042/BERS196.]

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

S.W.L's. AND QSL's

Editor "A.R.," Dear Sir,

Following a mail bag containing 38 letters from S.w.l's. over the last week, I find it necessary to comment on points that have, I feel, become out of control In replying to most of them.

Out of 38 reports only 2 had included stamped addressed envelopes. This is not a small matter, and may I remind the S.w.l. that he is not the only one requesting a QSL, there are many, many others doing the same and boy for the person replying to each report it entails quite an expense!

You may argue that you are doing the Amateur a service in giving him a report and he is indebted to reply. My answer to this is absolutely NO. If only the S.w.l. would stop to think of the Amateur's point of view he should realise that he is not interested in a report from a listener in the same city that the Amateur has been working at 5/9. Naturally he expects to be heard, and is not interested in a report.

My way of thinking, a report should be given under conditions, for example, when you are working W and are heard in G, where the report is of interest to S.w.l. and Amateur alike.

There may be the obvious reason for wanting a QSL (new country or district) and it stands to reason if the listener wants a QSL sufficiently he will, and does, include a stamped addressed envelope.

In conclusion, may I say I have found W.I.A. S.w.l's. generally do this or state QSL via the Bureau, which is not so bad, but to be expected to supply every S.w.l. with postage becomes quite out of the question and will be treated as such.

—D. A. McArthur, VK8KK.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

The A.R.R.L. advises the following W/VE QSL Bureau changes, effective immediately:

W5—H. L. Parrish, W5PSB, P.O. Box 9915, El Paso, Texas 79989.

VE2—Jack Ravenscroft, VE2NV, 135 Thorncrest Ave., Dorval, Quebec.

VE6—Karel Tettelaar, VE6AAV, Sub P.O. 55, N. Edmonton, Alberta.

K3VWH, Peter I. Sommsich, seeks publicity for a Boy Scout Radio Award just issued. Further info from this Bureau.

An expedition is planned to the State of Delaware for the second week-end in August, to provide this State and the County of Sussex for certificate awards. Operation will commence on Friday, 14th August, at 1700z and will terminate at 0300z on Monday, 17th August.

Following is the band, call and mode schedule:—

28 Mc.—K8LBQ/3, 28.6 Mc., a.m. and s.s.b.

21 Mc.—K8PLJ/3, 21.31 Mc. a.m., 21.41 Mc. s.s.b.

14 Mc.—K8GJM/3, 14.3 Mc. s.s.b., 14.045 Mc. c.w.

7 Mc.—K8PLJ/3, 7.260 Mc. a.m., 7.210 Mc. s.s.b., 7.045 Mc. c.w.

3.5 Mc.—K8LBQ/3, 3.935 Mc. s.s.b., 3.645 Mc. c.w.

All QSLs to K8LBQ. Further info from this Bureau.

Al Scarlett, W2CC, who was in VK April/May last year, now plans a further vacation tour June/July to England and Scandanavia. Must be nice to be well heeled!

—Ray Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BEANCH

Les 2ZBJ was the lecturer at the May meeting of the Branch and he chose as his subject "Receiver Front End Design." Following a very informative lecture concerned mainly with v.h.f. receiver designs, Les answered questions asked by the thirty members present. Even when most of the others had gone home at 11 p.m. Les was still discussing topics of mutual interest with a small group of v.h.f. men. Because of the illness of the lecturer there were three local members who stood in at short notice at the April meeting. They were Len 2ZFD and Des 2ZDN, who gave the introductory lecture and demonstration on 432 Mc. equipment, and Keith 2AKX, who spoke on and demonstrated a transistor broad band amplifier for h.f. receivers. Thirty-three were present at this meeting and the President reported that the committee had decided to hold an auction sale at the commencement of each meeting in future, members' gear being sold on commission.

The first of these sales took place in May and a small sum was earned for social committee funds and several members went away with bargain purchases. If you have any items which may be useful to other members and which you wish to dispose of, please bring them to the next or any meeting of the Branch stating your reserve price if any. Goods will be sold anonymously if desired and a 5 per cent. handling charge will be made. In any event, the sale will commence at 8 and will conclude at 8.30, whether all the goods are sold or not. So please be early at the next meeting and bring your surplus gear, but no junk.

The newly formed Radio Club at Teralba is now in operation and meetings are held each Wednesday night and Saturday afternoon. The A.O.C.P. class has twelve members and classes commence at 7.30 each Wednesday night. In addition to theory, Max McLachlan, who is an ex R.N. operator, is conducting an introductory Morse course to bring students up to 8 w.p.m. so that they may continue with practice from the Institute slow Morse sessions on 80 mx. The Saturday afternoon session is for Youth Radio Scheme members and is based on constructional work with a small amount of theory. By the time these notes appear it is hoped that the Club's transmitting station 2ATZ will be on the air on 80 and 40 mx. Members will recall that 2ATZ is the old Booragul call which has been transferred to the Westlakes Radio Club. If you are interested in either the A.O.C.P. or Y.R.S. classes at the Club, please come along at meeting times or write to "The Secretary, Westlakes Radio Club, P.O. Teralba, N.S.W."

Norm 2ZNF, who has been transferred by his company to Sydney, has been doing a week-end scramble these past weeks, living part time in Sydney and part time in Newcastle, but he now has a house in the smoke and has moved from our midst. We are sorry to lose Norm who was a keen v.h.f. man. Bill 2ZL smashed his magnifying glass the other day and is now unable to see his coloured slides, so he has bought himself a projector to augment the square eye viewing. Paddy 2AXU was so disgusted with the signal he was emanating that he decided to close down altogether. However, after connecting the aerial he was back on the next day. The Terror from The Terrace, Mac 2ZMO, has found that the squeaks in the 2 metre transmitter come from a nest of magpies on the bench behind the rig. Lionel 2CS is now firmly established in the DX paradise, Bolton Point, and already has a half wave on 80 mx in addition to other assorted wet strings.

Nothing at all has been heard from Cessnock and it is rumoured that all Chris' boys are busy trying to find a fault in a transistor portable and haven't had the time to come on the air. Alternatively, they are all in hibernation for the winter. Bill 2XT has managed to persuade the transport department to change the XT plates on to the new waggon and so it becomes the only one I've seen in the city with two letter plates. Frank 2APO has gone off on holidays to somewhere, but unknown to most. We are assured, however, that there are no telephones. What a blissful abode that must be!

Many of the boys are preparing for Oscar III. and those who have given this no thought are advised that the launch date looks like being September, so saddle up that unused two metre gear and make use of Oscar's relay facilities. Bill 2ZK took my advice and tried the easy way to get on 160. It took him ten minutes or so and he now puts out a fine signal on top band each Monday night. Top band is gaining popularity and with the winter now upon us, it promises to be the best band for local working with DX possibilities. John 2XQ is threatening to get on as well and with the newly licensed members being daily brainwashed about the advantages of 160, we should have a good team soon.

At the next meeting there will be some short cuts to successful 160 mx working, entitled "Top Band Without Tears" by your scribe. So come along and enjoy the auction sale if nothing else. Remember that it is on Friday, 5th June, in room 15 (or nearby room), Classroom Block, Newcastle Technical College, Tighes Hill, at 8 p.m. Shall we see you there? I hope so. 73, 2AKX.

CENTRAL COAST ZONE

Congratulations to Alec 2AAK on being elected President of the Gosford Radio Club. Reg 2AI continues as Hon. Sec. and Vice-Presidents include 2EH, 2RU, 2LX, and 2ON. The weekly A.O.C.P. class on Wednesday evenings has still 15 stayers, so we are hoping for some new calls during the next 12 months. Alec 2AAK still has regular skeds on 144 Mc. with 1VP Canberra. Alec works s.s.b. and 1VP is completing his s.s.b. rig. 432 Mc. is also claiming their attention. Alec is first building the tx and Eddie the rx. This path is about 200 miles, so it will be interesting to see what happens.

Reg 2AI has paid visits to Wagga and St. George, Queensland, recently, being heard clearly on his KWM2. 2AVJ is heard on 80 with some very nice sideband, home-brew, and 2ALA also nudged the band at times with a phasing-type tx. Ernie 2EH is building some high-fi gear and is talking about s.s.b. We'll have to start counting the a.m. exponents soon. Major 2RU is very pleased with his KW22 40 mx transceiver which uses one large printed circuit, and two t.v. line output tubes in the final. It should be mobile very soon.

2LX is heard now on a Swan three-bander. Looks as if we'll have to conduct classes in the use of the soldering iron, before long! Wally 2AXH is having fun removing Indians from his tx. It seems that all t.v. neighbours are not as helpful as they should be. He will be back on 80 phone very soon. Norm 2ALJ is in the pink, and is helping with the Wednesday classes while John 2ND is on three weeks' holiday. Norm has just returned from a holiday in VK3. Phil 2TX is now Secretary of Wyong Rotary Club. He has moved to a very fine location overlooking Tuggerah Lake and when he has time for more operating you should hear a good signal. He's supposed to be retired, but there must be a few household chores for him to do. He is able to work Alec on 28 Mc. without any trouble. Your scribe has returned from a busy but interesting holiday in Melbourne. The 145 Mc. f.m. net was demonstrated by 3XM. What a wonderful achievement on the part of the v.h.f. gang down there! 73, 2ON.

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VICTORIA

SOUTH WESTERN ZONE

Well chaps the Zone is not as active as it should be and we cannot put the blame on to each and every one of us, so what about it, are we to keep going as a zone or not? If we are to be active and remain active, what about coming on the Thursday night zone hook-up? We would like to hear someone from Ballarat, Geelong and Hamilton on each week. As you are all aware, we have already missed out on a Zone Convention. This is bad.

Norm 3EQ is getting going again on 14 Mc. Harry 3AXI is on each week and never misses out along with Bill 3WK. Doc. 3NA and Peter 3FX will be oack from their working holiday up in the Northern Territory at Yorkalla Mission. They had the Type 3 Mk. II. with them.

The Y.M.C.A. Radio Club is going along nicely at Warrnambool. VK3AAW is the call sign. Many thanks to all the local chaps who have aided the Club. They are members of the W.I.A., and all members intended to join the Institute. The Warrnambool Technical College Radio Club is getting a lot of help from Mr. John Ross. This Club is not linked with the Y.M.C.A. although we are always glad to assist at any time. Eric 3ANQ puts a lot of time in helping these boys, which is nice as Eric does not keep the best of health, but still finds a little time to help.

Don 3AKN, Bill 3XE and Bill 3WK have all taken to this flying business and by now will probably have obtained their licence. Don's XYL has already obtained same. Congratulations.

We are grateful to VK2AAK, Alex Swinton, of Kulnura, N.S.W., for donating some equipment to the Y.M.C.A. Radio Club. This has been sent to Bill Wines as Alex was a native of Warrnambool many years ago. Thanks, Alec. 73, Bill Wines, C/o. VK3AAW, Y.M.C.A. Radio Club, Warrnambool.

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QUEENSLAND

TOWNSVILLE AND DISTRICT

This month I find it hard to glean any news as the bands have not been treating me too kindly. No visitors to pass on anything and my super "private eye" (Bert 4LB) away down south in the big smoke, having a well earned rest. Hopes to meet up with many of the boys while in the big city.

The Cairns boys are also absent from the air at my QTH, so I am unable to follow in the footsteps of that illustrious writer "Pansy" and pad them when the news is scarce. Speaking of him, what has happened that he writes no more? The salary not high enough in these times? Would certainly like to read of him once again.

Other than my usual contact with Fiji, Norfolk and Sydney, I have nothing worth while to report. So someone call me up sometime and tell me what is doing around the North. 73, Bob 4RW.

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TASMANIA

Only two months plus to go to R.D. Contest! (It soon comes around, doesn't it.) So make a note to clean away the spiders and get the rig cleaned up and in good working order. Those little jobs that you've been putting off—now is the time to do them, not the Saturday morning of the Contest week-end. Let's make up our minds now to get the Trophy back in VK7 this year and you all know how it can be got—by whole hearted participation and log submission. Don't leave it to the other chap, get on the air, work your half dozen at least, a dozen would be better, a hundred better still. Write out your log, then post it. Remember only eleven week-ends to go and they'll soon fly past. Think how fast the last eleven have gone.

I've been doing a little research this last week and it's surprising what one can find out when you start delving. It all started when Tom 7AL, our worthy President, again this year, made a little speech at Snowy's 7CH farewell, to the effect that he (Snowy) had had 11 years as Councillor, starting way back in 1930 (yours truly was just out of three-cornered pants—hardly dry behind the ears), so I started to look through the little red book and I found that Tom 7AL is mentioned on Council 11 years, with nine as QSL manager, four as broadcast officer and the last five years as President.

Also noted that Terry 7CT has been a Council member nine times, Joe 7BJ has been voted in a mere thirteen times, Lon 7LJ has represented you for nine seasons. There were other gentlemen whose names cropped up quite often, Jack 7JB, Crosby 7CW, Len 7LE, Alan 7MY, Ken 7KA, to mention five others, but what struck me was the regularity with which these names occurred, if not as councillors, then these same work-horses had some other office to look after. Winston Churchill's famous words "Never before have so many . . ." certainly seem to ring true in VK7 land and I've no doubt in other Divisions as well.

The lecture at the May general meeting was a tape recorded commentary by Brian 7ZBE on colored slides taken during his sojourn in Antarctica. Brian is at present back on the Mainland, but I'm sure if he can be persuaded to talk (and he doesn't take much persuading) a very interesting evening can be had by his audience. Incidentally, our congratulations Brian, on your recent engagement. I knew twelve months isolation and only memories would do the trick. 73, 7ZAS.

NORTH WESTERN ZONE

Here we are half way through the year already, what with zone fees due, and all. Not a lot of activity in the zone at the present time, although I believe Kevin 7ZAH has now collected a nice number of VK3 QSL cards, and Ken 7KH has a UA0 XYL to his credit. David 7MS has a de luxe rx well on the way to completion after a long wait for parts. Be good to hear you back on the air again, David. Associates Winston and Bruce are both awaiting results of the last A.O.C.P. exam., and we hope that there will be two more "Z's" on the air soon. 73, 7ZBH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month and remittance should accompany the advertisement.

FOR SALE: Hallicrafter SX117 Receiver, xtal locked front end and 3rd conversion oscillator—triple conversion—external outlet for v.f.o. and oscillator for transceiver operation, used on all frequencies between 3.5 and 30 Mc., with extra xtal Ham bands included, ½ microvolt sensitivity, exceptionally low noise level, high stability, 500 cycle 2.5 Kc. and 5 Kc. selectivity, selectable product detector and envelope detector for s.s.b., c.w. and a.m.; 100 cycle Kc. calibration, T notch filter, i.f. noise limiter, 1 Kc. marks on tuning knob. Reason for sale, standardising equipment. In as new condition, this receiver will match the performance of any commercial receiver available in Australia today. Price £250. HA10 very low frequency attachment for SX117 Receiver, 85 Kc. to 3 Mc., Price £17. VK2AAK, Kulnura, N.S.W.

FOR SALE: Heathkit "Cheyenne" Tx, 80-10, v.f.o., xtl. control, 90w., excellent condition, £80. Geloso r.f. deck, 150w., 2E26, QB3/300, metered, shielded, rack mounted, nicely finished panel, £25. Sweep and Marker Gen., R.T.V. & H., well built, calibrated, Oxford panel, 5.5 Mc. xtl., £25. Lafayette HE-30 Rx, £55. Murphy B40 Rx, £40. W. J. Bell, VK3WK, Wangoom, Vic. Phone Grasmere 225.

FOR SALE: AR7 Receiver, good condition, complete with power supply, speaker, rack and all general coverage coil boxes, £27/10/0. Hepburn, VK3AFQ, 4 Elizabeth St., East Brighton, Vic. Phone 96-2414 evenings.

FOR SALE: KWM2 with all latest Collins mods., done by Collins U.S.A., good appearance, complete with CC2 fibre glass carrying case and manual. Purchasing S Line. Good buy, £500. VK2AAK, Kulnura, N.S.W.

GELOSO Transmitter 222, perfect condition, 100% performance, gone s.s.b. VK3AVU, 200 Elgar Rd., Box Hill South, Vic. Phone 28-2785.

HAMMARLUND'S best, in excellent condition, HQ170E (230v.) triple-conversion, Ham band (5-160m.) receiver, ±3 kc. vernier tuning, 0.5-1-2-3 kc. selectivity, slot filter, adjustable a.v.c., noise limiter, matching speaker, £175. HX500, 150w. filter-type s.s.b./a.m./c.w./f.s.k./f.m., vox, p.t.t., a.l.c., antenna relay, approx. 30 hours use, £315. Both for £475 TM1G monitor, £8 Vibroplex £5. VK1JM, J. W. Miles, 129 Mugga Way, Red Hill, A.C.T.

KWM2-A with external Collins p.t.o, can cover 14 commercial channels outside Amateur bands, excellent condition, £500. Arie Bles, VK2AVA, 33 Plateau Rd., Springwood, N.S.W. Phone 394.

SELL: Geloso G209R Receiver for Ham bands, complete with crystal filter and selectable sideband switching, new condition, £95. Write VK-3ML, 384 Glenferrie Rd., Malvern, Vic.

SELL: Heathkits in good order: "Apache" Xmtr., 150w., 80-10 mx; SB10 S.s.b. Adaptor, 80-10 mx; "Marauder" Xmtr., 150w., s.s.b., a.m., c.w.; "Mohawk" Rcvr., 160-10 mx plus 6 and 2 mx, with converters; "XC2" 2 mx Converter, xtal locked; Dow-key Electronic T/R Switch; "SX42" Matching Speaker, hi-fi and comm. Offers to S. E. Widgery, 39 York St. West, Ballarat, Vic.

SELL: Wagner S.s.b. Transceiver, upper or lower sideband or break-in c.w. on 80, 40, 20, 15 and 10 mx, mechanical filter, built in vox, p.t.t., "S" meter, xtal cal., separate v.f.o's. for both receive and transmit, 1 kc. calibration, complete with speaker and a.c. power supply in matching cabinets, ideal for mobile or home station, as new condition. VK2DM, 40 Ware St., Fairfield, N.S.W. Phone 72-5601.

WANTED: AMR100 coil boxes, crystal filter and manual. Contact R. Bowden, L2280, 40 The Grove, Mosman, N.S.W. Phone 96-3570.

WANTED: Return of AR7 Handbook lent to Dept. Education colleague at 1960 A.O.C.P. Course. R. N. Fenton, VK3ARF, 67 Lyle St., Warracknabeal, Vic.

WANTED: SCR522-BC625 Transmitter, any condition, cheap, or parts of same. Peter Garde, 154 East Boundary Rd., East Bentleigh, Vic. Phone 57-4393.

WARBURTON FRANKI

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A.C. OPERATED

Covers from 360 Kc. to 220 Mc. in eight bands. Each of the eight Coils is Colour Coded to match a coloured dot on the face of the meter corresponding to the particular range being used. The meter is an edge reading type 0-500 microampere, calibrated in increments of 50. A sensitivity control, on-off switch and osc./diode switch are provided on the front panel.

£17/17/4

+ S.T. 12½% + Postage to cover 3 lb.

TRANSISTOR MICROPHONE MIXERS

Will mix inputs from four hi-impedance microphones. Contained in an attractive metal case 6" x 2¾" x 2¼". Connection by standard phone plug. Battery supplied.

72/- each

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6/3 each + S.T. 25%.

70/- doz. + Tax.

Special Price for larger quantity on application.

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Single hole mounting, Type C15, 1.2 Henry + 10%.

10/- each

+ S.T. 25% + Pack and Post 1/-

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Flanged lid held with six 4 BA counter sunk screws, suitable for Transistor Power Supplies, etc. The metal is heavy enough to be used as a heat sink.

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4-7/16" x 2-7/16" x 1" deep, 11½ ozs. **17/1**

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+ S.T. 25% + Postage

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A & R POWER TRANSFORMERS TYPE 1895

325-0-325v. at 125 mA., 6.3v. tap 5v. at 2a., 6.3v. c.t. at 2a., 6.3v. at 2a.

BRAND NEW IN ORIGINAL CARTON

45/- each

+ S.T. 25% + Postage to cover 7 lb.

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325-0-325v. at 175 mA., 5v. at 3a., 6.3v. at 3a., 6.3v. c.t. at 3a.

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55/- each

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Iron Only **39/6**

Iron and Transformer **85/-**

S.T. Exempt. + Pack and Post, Iron 6d., Iron & Trans. 3/6

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Ronette 284-OV. Monaural, turn-over type fitted with L.P. Diamond and Std. Sapphire.

45/- each

+ S.T. 25% + Pack and Post 6d.

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Imported, plastic base, first class quality

3 inch 200 ft.	5/3
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All plus 12½% Sales Tax plus Postage.

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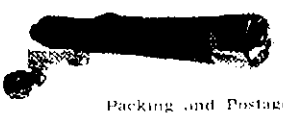

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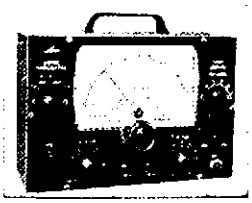

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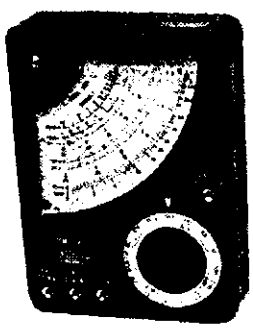

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Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

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OUR COVER

The first S.s.b. Convention in Australia was held at Hamilton, Vic. Details of this event will be found on page 13.

FEDERAL COMMENT

★

50th ANNIVERSARY

It is pleasing to record the 50th Anniversary of the American Radio Relay League in this year of 1964. Two other Societies have also recently passed this historic milestone—our own Society, the W.I.A. in 1960, and the Radio Society of Great Britain in 1963. Since its formative years, the A.R.R.L. has become the largest and most influential Society of Radio Amateurs in the world.

One might be forgiven for believing that it is because the A.R.R.L. has such a large membership—now nearly 200,000—that it has "ploughed" its way to the top. Undoubtedly, a healthy membership is a big factor, but the real reason lies deeper than this. The key lies partly in the foresight of its early pioneers, their proximity to the "old world", their sound foundation for their organisation, and more than a modicum of that innnate American ingenuity and persuasive, business sense.

Although it is generally conceded that Great Britain developed radio broadcasting, it was our American contemporaries who saw the future possibilities of this medium and made it a commercial proposition. It was therefore to be expected that the early Radio Experimenters in the U.S.A. would take advantage of commercial components and take a leading part in experiment work and become the major power in Amateur Radio.

It was perhaps natural for the A.R.R.L. to take a lead in the formation of an international union of Amateur Societies in 1926, the year in which the International Amateur Radio Union was born and of which the W.I.A. was a foundation member. Later in 1927, at the Washington Radio Conference, the A.R.R.L., backed by their government, fought almost a lone hand against strong opposition to assign special bands of frequencies for Amateur use. They won the day, and established a precedent for which all Radio Amateurs today may be justly grateful.

The A.R.R.L. and the I.A.R.U. have, through the years since those early days, fought strongly for and defended Amateur privileges, and it is mainly their efforts which enable us to enjoy our hobby today. The A.R.R.L. have been the sole financial supporters of the I.A.R.U. since its formation and can be satisfied the Union now boasts membership from over 50 countries including the U.S.S.R. The A.R.R.L. can be justly proud of its record in Amateur affairs and in this, their anniversary year, of moving into magnificent new quarters in Newington.

It is therefore with gratitude and great pleasure that we associate ourselves with the A.R.R.L. in their Golden Anniversary celebrations and wish them well for the future. The A.R.R.L. has set Amateur Radio a great example over the years—all I.A.R.U. Societies could not do better than emulate this fine example.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

YOUR PYE REPORTER, PTCA-116, Mk. II.

PART ONE—THE RECEIVER

DAVID PRIESTLEY, WIA-L3163*

Due to a large number of Pye Reporters already on the market, and the number that come up for sale from time to time, these instructions are published to enable more of the Australian Amateur fraternity to make good use of these sets, and at the same time give us an Australia-wide 6 metre band net.

These instructions are not to be confused with those that appeared in the September 1963 issue of "Amateur Radio," which were to do with the PTCA-116 Mark I. Lining up procedure for both sets is entirely different as was discovered when trying to line-up according to instructions for the Mark I. series.

The signal generator used was a Hewlett Packard with sensitivity of 0.1 of 1 microvolt, and 0.001 of 1 cycle per second accuracy.

The experimental set, owned by the author is sensitive to ½ microvolt, and is accurate, in the receiver, to within 2 cycles per second of the net frequency.

Pertinent details for receiver line-up are as follows:—

Signal frequency	53.0320	Mc.
Crystal frequency	13.98833	„
1st i.f. frequency	11.02763	„
2nd i.f. frequency	2.96070	„

Coil numbers are taken from the circuit of the PTCA-116, Mark II.:—

L1—7½ turns 18 g. tinned copper wire.

L2, L3, L4—6½ turns 18 g. enamelled copper wire.

L5—28 turns 23 g. enamelled copper wire.

RECEIVER ALIGNMENT

Because of deterioration brought about by ageing, it will be necessary to replace Westector diodes 1, 2 and 3 in the circuit. Diode type AA119 will be found to be efficient, yet favourably priced.

Set all trimmers to approximately half mesh and adjust Philips trimmers on T1 to about 1-1½ turns from full mesh.

Adjust slug in L5 for maximum reactance.

Set signal generator to 2.96070 Mc. and check T2, T3, T4 and T5.

Set signal generator to 11.02763 Mc. and feed into L4 at the join of C11. Reset Philips trimmers to maximum output level.

At the Pye connector feed in a signal at 53.0320 Mc. and readjust all trimmers for maximum output.

The result should be quite rewarding.

A quick check around Amateurs in metropolitan Melbourne showed an abundance of circuit diagrams for the PTCA-116 Mark II. Reporters. It is known too that many Amateurs in other States have these circuits, and it was felt that the cost involved of redrawing circuits would not be warranted with this fact in mind.

It should also be noted that the majority of Amateurs using this frequency are using vertical polarisation and that unless a cubical quad or whip aerial is used, nothing will be forthcoming.

In VK3 land, the net is most active during the week-end and good strength signals can be heard coming from all over the metropolitan area, with the occasional foreigner from VK7 land riding the noise.

For a whip aerial we used a piece of stainless steel rod, purchased for about 3/-. The rod, of one-eighth inch diameter was cut to 58½ inches in length and fed into the receiver through 50 ohm coaxial cable.

The impedance of the feeder is critical, and every endeavour should be made to use the correct Pye connector, readily obtainable through disposals.

How to line up the transmitter, what to do and what not to do when doing this very finicky job will appear in a later issue.

* C/o. R.A.A.F. Base, Werribee, Vic.

KEEPING OUT OF THAT MODULATED MILK BOTTLE

With the advent of more t.v. stations coming into operation, it is a pretty good bet that more and more Amateur transmitters will be putting those unwanted harmonics into these frequencies. Having been through this, may I be permitted to pass on the findings of experiments from here.

Situated approximately 100 miles from the Adelaide transmitters, and with a reading of about 10-40 microvolts during daylight hours, you will see that it called for drastic measures. The grid dipper was tried out at about one watt out and successfully blacked out all channels with a second or third harmonic.

Then the following in order was brought about, and over a period of time the interference was brought to a minimum. So much so, that we could go on 20 metres and cause no t.v.i. with 100 watts. I must, in all fairness, say that some nights here the signal is as strong as the viewing in the metropolitan area, however this is rare. T.v. is viewable each night.

So, do not have any shafts that are hot to r.f. protruding out from the cabinet.

All meter leads to be shielded and suitably by-passed as per A.R.R.L. Handbook. Meters to be shielded.

Completely shield the transmitter in a steel box, bore only a minimum of holes for ventilation, no holes to be larger than one quarter of an inch and no closer together than this distance.

Avoid using large pieces of copper gauze.

Instal a pi coupler on the output, if possible on the driver stage, of good design.

Keep your grid drive as near as possible to the correct amount, if anything slightly low.

Keep all low-level stages tuned to resonance.

Obtain your operating frequency with as few stages as possible.

It is a waste of time to carry out any tests without the t.v. transmitter on the air. If you have one particularly bad channel you find is causing you concern, it may be a good idea to instal a series resonant trap at the coax terminal inside the transmitter, tuned to the t.v. transmitter's frequency.

Coaxial output is a must to the tuner, into which must be inserted one low pass filter, but in the case of 21 Mc. it will be better to instal a half wave filter. However this will have to be changed each time you change bands. Reference for half wave filters (July "A.R." 1957).

It would also be advisable to instal an s.w.r. bridge in this lead also.

Keep your antenna as far away as possible from the t.v. antenna.

A good earthing system is very necessary, with a very short lead.

Once you get to the aerial tuner, it does not seem to matter what type of feed you use to the antenna, as you should not have any harmonics present.

Do not shift frequency without retuning the transmitter.

Watch all diodes you may have in monitors, especially those with a long length of wire to energise them, as these can cause trouble.

The experiments on the above subject are unlimited, but the foregoing should remove most of the interference from most transmitters.

Follow the elimination diagram in the R.S.G.B. Handbook re t.v.i.

Particular pains should be taken in the by-passing of leads, both h.t. and heaters. Leads that go from compartment to compartment should also be by-passed with disc ceramics.

It is a fascinating subject and a lot of satisfaction can be had when it is eventually conquered.

—Bert Behenna, VK5BB

A 5/8 WAVELENGTH VERTICAL FOR TWO*

HERBERT S, BRIER, W9EGQ

● This ⅝ wavelength vertical antenna is ideal for mobile or fixed operation and particularly for nets and local ragchewing.

WITH all the descriptions and pictures of multi-element v.h.f. beam antennae seen in the various Amateur journals, some Amateurs forget that the simple vertical v.h.f. antenna still has definite advantages for certain types of operation. A vertical antenna, for example, is much simpler to install and far less conspicuous on an automobile than a horizontal antenna. Also the omni-directional radiation pattern of the vertical antenna is highly desirable in local v.h.f., C.D., emergency and ragchewing nets where none of the stations are very far apart, but who are scattered in every direction of the compass. Under these conditions, a beam is often a disadvantage, because, in no matter which direction it is turned, you can't hear all the stations in the net.

What we really need is to retain the advantages of a vertical for local work, and, at the same time, achieve a little antenna gain—without too many complications. Actually, there is an antenna that meets these specifications. It is the ⅝ wavelength vertical. Although it is 2½ times as long as a ¼ wavelength antenna, the ⅝ wavelength antenna has a power gain of almost 3 db., and the resulting length (four feet on 2 metres) is easily accommodated on the v.h.f. bands. Equally important, the antenna is simple to build, as indicated in Fig. 1.

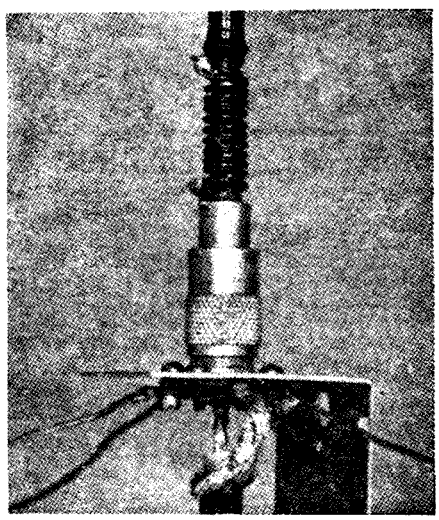
THEORY OF OPERATION

Touching briefly on the operation of the ⅝ wavelength antenna, as a short vertical antenna is increased in length, its radiated power is concentrated more and more at angles approaching the horizon. But, as the length exceeds ½ wavelength, a secondary lobe of high-angle radiation develops in the radiation pattern. In spite of this, the low-angle radiation from the antenna continues to increase until a length of ⅝ wavelength is reached. Beyond this length, however, the low-angle radiation decreases, and the high-angle radiation increases. Thus a ⅝ wavelength vertical antenna gives the maximum low-angle radiation possible in a simple vertical antenna.

Because a ⅝ wavelength is a non-resonant length, a small inductance is connected in series with the antenna to increase its effective electrical length to ¾ wavelength (without changing its radiation pattern). With the addition of the loading coil, the ⅝ wavelength antenna sketched in Fig. 1 has a feed-point resistance of approximately 50 ohms, a close match for 50 ohm coaxial cable.

CONSTRUCTION

To construct the antenna, obtain an inexpensive fibre-glass fishing rod at least four feet long and approximately ¼" in diameter at the large end. Such rods are often available for less than $2.00 during special sales at sporting-good and department stores. Detach the rod from its handle, and remove the ferrules from the rod. On some rods, the ferrules are fastened to the rod with wrappings of cord and are easily removed completely; on others, they are crimped in place. If yours is of the latter type, it may be better to clip off as much as possible of the ferrules, and smooth off the remaining rough edges with a file. Then, measuring from the large end, cut the rod to a length of 48".



Close-up of the base section of the 2 metre antenna showing the loading coil and ground plane assembly for fixed station operation. Connections to the coax line were left untaped to show the details. Tape these connections and the connector for weather protection.

Drill a 3/32" hole through one side of the rod an inch from the large end, and thread a length of No. 14 bare copper wire through the hole and out the bottom of the rod (which is usually hollow at this point). Allow about an inch of the wire to protrude at each end. Next, place a PL-259 type coaxial connector over the end of the rod, threading the No. 14 wire through its centre contact. Cement the connector in place with epoxy-resin or similar adhesive. After the cement has set, solder the wire to the connector.

Remove the outer vinyl coating from a four-foot length of RG-58/U or similar coaxial cable, and slide the shield braid off the cable on to the fibre-glass rod. Push the braid down to within about two inches of the bottom of the rod. Next wrap a turn and a half of No. 14 wire around the shield braid 1½" above the previously-installed wire. Allow about an inch of the wire to protrude at right angles to the rod and parallel to the first wire. Solder the wire to the braid and trim off the excess braid below the wire. Next, tightly wrap the shield braid with plastic electrical tape. Finally, space wind an 11-turn coil of No .14 wire in the 1½" space between the two protruding wires on the rod, terminating the ends of the coil at these wires.

INSTALLING THE ANTENNA

For a mobile installation, mount a standard, chassis-type coaxial connector on the automobile fender, roof, or trunk, etc., and screw the antenna to it. The photograph gives hints for constructing a ground-plane base for using the antenna in a fixed-station installation.

The four ¼ wavelength radials (19¼" long) shown in the picture are constructed of No. 12 wire; but, for increased rigidity and improved appearance, No. 10 or larger wire is recommended. Suitable wire in various gauges can be obtained in the form of plastic-covered house wire from electric supply and mail order houses. Remove the plastic coating before using the wire, of course. You can also obtain heavy duty solder lugs for mounting the radials from the same sources. Of course, 50-ohm coaxial cable is used to feed the antenna.

ADJUSTMENT

Connect an s.w.r. bridge in the feedline between the transmitter and the antenna, and vary the spacing between turns in the antenna loading coil for minimum feedline s.w.r., which was just over 1½ : 1 in this installation. Depending on the actual diameter of the fibre-glass rod used and other variables, it may be necessary to add a turn to or subtract a turn from the loading coil to obtain minimum s.w.r. After the coil is adjusted, solder its ends to the protruding leads, trim off the excess wire, and coat the coil with low-loss dope to weather-proof it and to hold the turns in place.

(Continued on Page 6)

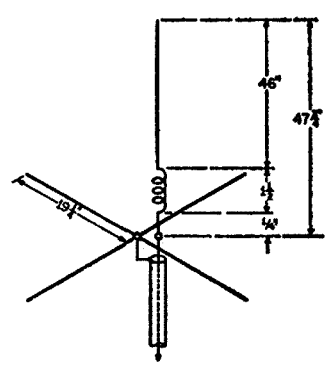


Fig. 1.—Construction details for the 2 metre ⅝ wavelength antenna. The antenna base is a PL-259 coaxial connector on an SO-239 with four No. 10 copper wire radials, 19¼ inches long, attached. The loading coil has 11 turns of No. 14 wire wrapped around the 48 inch x ¼ inch fibre-glass rod.

* Reprinted from "CQ," February 1964.

SINGLE SIDEBAND:

AN EXPERIMENTAL SINGLE CRYSTAL FREQUENCY SYNTHESIZER*

G, R. B. THORNLEY, G2DAF

MANY experienced s.s.b. workers are looking for an improved method of transmitter frequency control. The conventional v.f.o. using some form of tunable LC oscillator has the merit of simplicity, but unfortunately it suffers from frequency drift. To give some idea of how great this frequency error can be, it is of interest to examine the figures given in the Collins publication "Fundamentals of Single Sideband." These are shown, together with figures of other types of oscillators, in Table 1. It is also important to realise that the errors quoted are for a v.f.o. of first class design and construction made with all the resources of a large factory. The home constructor would be very lucky indeed if he could match these figures—in practice his frequency error is likely to be much worse than the figures given.

So far as Amateur stability requirements are concerned, the crystal oscillator can be considered drift-free. It follows therefore that the ultimate aim is some method of providing the required v.f.o. output, but in some way obtained from, or controlled by, a stable quartz crystal oscillator.

One method of doing this is the result of some experimental work undertaken by the writer in which the output of a stable 100 kc. quartz bar is divided down into 2.5 kc. "steps" and the "steps" given continuous coverage by "pulling" the crystal. [The basic principle together with a block diagram of the associated stages was given in Single Sideband, R.S.G.B. "Bulletin," Nov. 1963.] That part of the equipment associated with the balanced converters, V4 and V5, the bandpass filter, the v.f.o. and the tunable output stages is conventional circuitry that is well known. The early stages comprising the 100 kc. oscillator, the frequency dividers and the harmonic amplifier will, however, be relatively unfamiliar. These will now be described in detail.

Fig. 1 shows the circuit diagram of all stages up to the input of the first converter V4. The first valve, V1, is arranged as a Colpitts oscillator using either an EF80 or EF91 valve. A variable capacitor of 50 pF. is connected effectively in shunt with the 100 kc. quartz bar. This is the **fine tuning** control, and is used to "pull" the crystal the small amount necessary.

Output from the oscillator V1 is fed via the 50 pF. capacitor to the anode of a blocking oscillator V2a. The oscillator repetition frequency is controlled by the time constant of the 500 pF. capacitor and the 330K ohms resistor in the grid circuit. Transformer T1 is used to couple energy from the anode back into the grid circuit to maintain oscillation. Fine control of repetition rate is obtained by the 25K ohms preset potentiometer VR1. The blocking oscillator is adjusted to run at approximately 20 kc. and is held in synchronisation by the triggering pulses from V1 (i.e., every fifth sine wave from the 100 kc. oscillator anode arrives at the right moment of time necessary to initiate the start of the 20 kc. blocking oscillator waveform).

The second blocking oscillator V2b is made to run at a lower frequency by the greater value of the grid capacitor —in this case 0.002 μF. Fine control of repetition rate is obtained by the potentiometer VR2 so that the oscillator free runs at approximately 5 kc. It will be noted that the 0.002 μF. grid charging capacitor is not returned directly to earth (as in the grid circuit of V2a) but is returned via a 200 ohm resistor that is also part of the cathode circuit of V2a. This provides the synchronising pulse, and the reason for taking this pulse from the previous oscillator cathode instead of the more obvious transformer side of the valve will be described later.

The third blocking oscillator, V3a, has the time constants of the grid circuit chosen to run at a lower speed than V2b. Potentiometer VR3 is adjusted until the repetition speed is approximately 2.5 kc. The synchronising pulse is again taken from the pre-

LONG TERM FREQUENCY ERROR

Oscillator Type	Error %	Error c.p.s. 3 Mc.	10 Mc.	30 Mc.
Variable Frequency Oscillator ..	0.05	1,500	5,000	15,000
Crystal Oscillator	0.005	150	500	1,500
Temperature Controlled Crystal Oscillator	0.001	30	100	300
Precision Standard Oscillator ..	0.0001	3	10	30

SHORT TERM FREQUENCY ERROR

Oscillator Type	Error P.P.M.	Error c.p.s. 3 Mc.	10 Mc.	30 Mc.
Variable Frequency Oscillator ..	20	60	200	600
Crystal Osc. and Temperature Controlled Crystal Oscillator	1	3	10	30
Precision Standard Oscillator ..	0.01	0.03	0.1	0.3

Table 1.
P.P.M.—Parts per million.

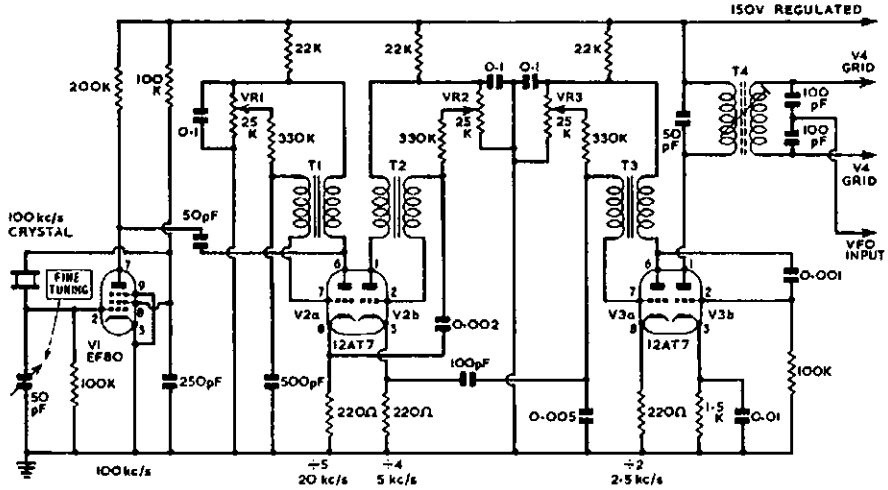


Fig. 1.—Circuit diagram showing crystal oscillator, blocking oscillator dividers and harmonic amplifier. VR1, VR2 and VR3 may be ½w. pre-set potentiometers. All resistors ½w. rating.

* Reprinted from R.S.G.B. "Bulletin," Dec. '63.

vious oscillator cathode, but in this case via a 100 pF. capacitor to limit the pulse amplitude.

It will be seen that the stable signal source has a repetition frequency of 100 kc. and that V2a, set to 20 kc., is dividing down by a factor of five. V2b set to 5 kc. is dividing down by a factor of four, and V3a set to 2.5 kc. is dividing down by a factor of two. The total blocking oscillator chain is therefore dividing down by 5 x 4 x 2 = 40 and is therefore producing an output of 2.5 kc. that is locked back to, and controlled by. the 100 kc. stable crystal oscillator.

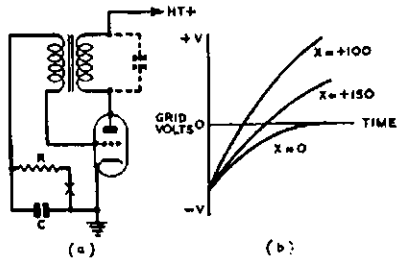


Fig. 2.—(a) Blocking oscillator circuit (point X may be taken to a source of positive potential). (b) Graph showing discharge of capacitor C. If resistor R is returned to a source of positive potential, discharge speeds up and cuts zero bias line at a more acute angle—giving improved accuracy of hold control.

The large amplitude pulse at the anode of V3a is coupled via the 0.001 μF. capacitor to the grid of the harmonic amplifier V3b. This stage is driven positive into heavy grid current that takes the valve into class C operation and a small angle of anode current flow that is rich in harmonic output. Transformer T4 is resonated at 3.25 Mc. and this feeds a spectrum of 2.5 kc. harmonics—over the range 3.0 to 3.5 Mc.—into the following converter valve grids.

The blocking oscillator transformers used in the prototype were Haynes Radio Type TQ132 connected so that there is a step **down** from the anode to the grid. Standard inter-valve audio transformers of 3 : 1 or 4 : 1 should be equally suitable.

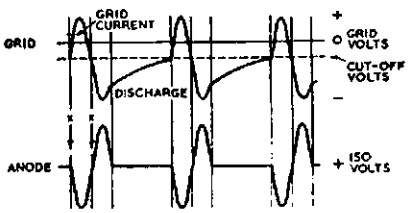


Fig. 3.—Blocking oscillator—grid and anode waveform width XX determined by resonant frequency of transformer primary.

BLOCKING OSCILLATOR FREQUENCY DIVIDERS

Blocking oscillator time bases are widely used in domestic television receivers because they are easily synchronised and the degree of "hold" or "lock" is very good. It is this characteristic that makes it possible to provide a 2.5 kc. output that will still remain in synchronisation with the 100 kc. controlling source while this source is being "pulled" in frequency by the fine tuning variable capacitor.

A basic blocking oscillator circuit is shown in Fig. 2; loosely this can be looked upon as a tuned anode oscillator with a coupled feedback winding of a type commonly used for r.f. application, but so proportioned as to provide an extreme case of intermittent oscillation. This is achieved by (i) making the anode inductance large and using only the valve and distributed capacitance for tuning; (ii) using a turns ratio between anode and grid so that the peak grid driving voltage is high; (iii) using a grid capacitor that is not too large; and (iv) employing a grid leak of sufficient resistance to make the time constant RC large.

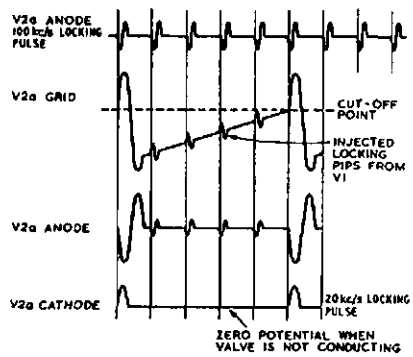


Fig. 4.—Oscilloscope trace at various points in the circuit of the first divider V2a.

Under these conditions the waveforms that are generated have the character shown in Fig. 3.

A full explanation of the action of the blocking oscillator is so complex, it is outside the scope of these notes. Some knowledge of the way in which the oscillator waveform is derived will, however, be of value. Briefly, a single half cycle of oscillation will build up sufficient charge on the grid capacitor C to provide a bias that is much greater than the cut-off bias of the valve. At this moment of time the valve ceases to conduct and the energy stored in the resonant system is dissipated in a damped oscillation that is super-imposed on the bias voltage across the grid

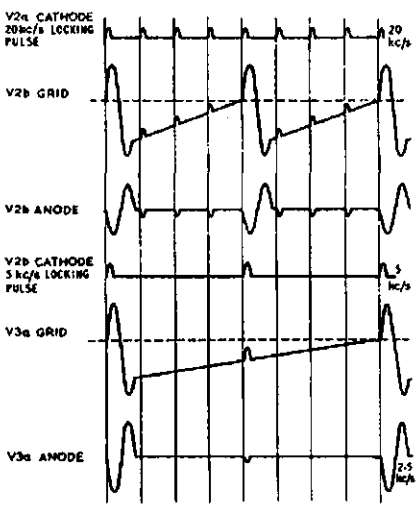


Fig. 5.—Oscilloscope trace at various points in the circuit of the second and third divider V2b and V3a.

leak capacitor combination. This bias voltage, decays exponentially according to the time constant of RC; when it reaches the cut-off value of the valve, anode current again flows and the cycle then repeats.

A cathode ray oscilloscope is necessary in order to set up the dividers. The oscilloscope trace at various points in the circuit of the first divider V2a is shown in Fig. 4. VR1 is adjusted until exactly four pips appear during the discharge period of the grid charging capacitor, as shown. There is therefore one oscillation for every five oscillations of the 100 kc. crystal and the blocking oscillator is dividing down by a ratio of five. During the duration of the 20 kc. pulse, V2a grid is biased beyond cut-off, and the valve is not conducting, therefore the cathode is at zero potential. At the onset of grid current, V2a conducts heavily, a potential appears across the 200 ohm cathode bias resistor and produces a positive-going pulse. This pulse at the repetition frequency of 20 kc. is used to lock the second divider.

The various oscillograms for the second and third divider are shown in Fig. 5. In this case VR2 is adjusted until exactly three pips appear during the discharge period, and the divider is then running at exactly one quarter the frequency of the incoming 20 kc. synchronising pulse—that is at 5 kc. Finally VR3 is adjusted until one pip appears in the centre of the discharge period of V3a. This divider is then running at half the frequency of the incoming 5 kc. synchronising pulses, that is at the required final output frequency of 2.5 kc. ●

☆

A Five-Eighth Wavelength Vertical for Two

(Continued from Page 3)

In a ground-plane installation, the position of the radials will affect the s.w.r. obtained. As a suggestion, start with them slanting downward from the base of the antenna about 30 degrees. Then, after the antenna coil is adjusted for minimum s.w.r., try bending the radials up and down for a possible further slight reduction in s.w.r.

ADDITIONAL CONSTRUCTION NOTES

If you can find a shop where fishing rods are repaired, you may be able to obtain a fishing rod "blank" for much less than the cost of a complete rod. Also look around for a broken rod from which the 48" length can be salvaged. Incidentally, adjustment of the coil will compensate for slight differences in rod length, but don't exceed the specified length.

RESULTS

Experience shows that replacing a ¼ wave vertical with the ⅝ wave type definitely increases transmitting range somewhat, but the greatest improvement is apparent on reception, especially when the antenna is low. ●

Construction and Calibration of a V.F.O.*

JOSEPH A. SMITH, W9ZDN

THE usefulness and dependability of a v.f.o. can be greatly enhanced by an accurate calibration to within one kilocycle. To do this, naturally, the first step is to construct a truly stable v.f.o. that possesses both short and long run frequency stability; that is stability over a period of many days, not just one or two days.

This article presents an example of a time proven v.f.o. of this extra-stable type. Its drift over a one-week period usually does not exceed 0.04% or roughly that of the usual run of a non-precision crystal.

In other words, although this v.f.o. is placed on standby during reception periods of a QSO, it still does not drift more than 400 to 500 cycles during a week of operation. Naturally, a normal warm up period is used.

How, you may ask, is this stability obtained? Well, in the following manner:—

1. The Clapp oscillator circuit is used.
2. A combined unregulated and super-regulated power supply is built-in to furnish 350 volts unregulated to the plates of the two buffer stages, and 150 volts (plus or minus one volt) for the oscillator and both buffer stage screen grids.
3. The v.f.o. operates in the 160 metre band, and output is taken from the plate tuned second buffer-doubler on 80 metres.
4. N.p.o. capacitors are used across the oscillator's silver mica grid capacitors.
5. All oscillator parts are firmly mounted.

CIRCUIT DESCRIPTION

The circuit of the v.f.o. is shown in Fig. 1. Actually it might more accurately be called an exciter for it has considerable output. A 6AG7 is used in a series tuned Clapp circuit in the 160 metre band. A 6F6 untuned buffer follows the oscillator to provide maximum isolation. This stage is followed by a doubler to bring the output frequency into the 75-80 metre band. This circuit will work well with an 80 metre coil in the oscillator tank circuit and double into the 40 metre band with a 40 metre tank coil in the output.

The power supply is super-regulated for the plate of the oscillator and all the screen grids. The plates of the 6F6 buffer and 6L6 doubler operate directly from the filtered 350 volt line.

CONSTRUCTION

The construction techniques used to build this or any v.f.o. are critical. Mechanical construction **must** be sound. For example, a heavy steel or aluminium panel should be used and it should be thoroughly braced at the ends. Both variables in the oscillator circuit **must** be secured firmly so that they will cause no instability. There must be adequate ventilation and any shielding must be rigid.

* Reprinted from "CQ," July 1963.

● This stable v.f.o. exciter covers 80 and 40 metres and can, with slight modification, cover 160 also. Part of the package includes a super-regulated power supply and output is about 5 watts.

The **bandset** variable is a 140 pF. capacitor located under the chassis near the oscillator coil. The **bandspread** capacitor is a 50 pF. double bearing type from which a number of rotor plates will be removed in the calibrating procedure to follow.

CALIBRATION

The dial used is a National Type N Velvet Vernier and it is calibrated from zero to 100. A scale for subdividing a single scale division into tenths is also affixed above the main dial. The actual frequency calibration is done on a sheet of graph paper 22" x 17". It contains 16 large squares across and 21 large squares down. Each one inch square is further subdivided into $\frac{1}{8}$" units. For this calibration each $\frac{1}{8}$" division is equal to 2 kc. One kc. therefore is a half of the $\frac{1}{8}$" square. Two scales were plotted in our calibration. First the 80 metre band and then the 40 metre band.

The actual calibration procedure requires the use of some standards. An accurately calibrated receiver such as the Collins 75A line is desirable as well as a stable crystal oscillator.

With the **bandspread** variable at about half mesh, adjust the **bandset** capacitor to zero-beat against a 3.75 Mc. crystal. The accuracy of this crystal can be checked against WWV on 15 Mc., the fourth harmonic of 3.75 Mc.

Next set the **bandspread** variable to minimum capacity and adjust the turns on the v.f.o. coil so that you are tuned just inside the upper limit of the 80 metre band.

Now, rotate the **bandspread** capacitor so that the plates are fully meshed. This should bring you close, **but inside,** the lower edge of the band. If you move outside the band, remove one rotor plate at a time until the frequency drops back into the band.

With crystals in the 80 and 40 metre band check as many points as possible making a listing of dial reading versus frequency. In between points may be checked on an accurate receiver or a BC221 frequency meter, if available. Plot all the points on the graph, dial readings on the horizontal axis and frequency on the vertical axis and connect the plotted points.

Finally, once each week, check the v.f.o. against WWV at 15 Mc. (v.f.o. at 3.75 Mc.) and correct any long term drift with the **bandset** capacitor. ●

1,250 FT. TUBULAR MASTS

Contracts were recently signed in England for the construction of the two highest t.v. masts in Europe. They will be 1,250 feet high and located in Yorkshire and Lincolnshire. These masts, unlike the usual kind built of a latticework of steel girders, will consist of a steel tube, 9 feet in diameter, with a lift inside to enable the aerials to be serviced!!

—L3042/BERS195.

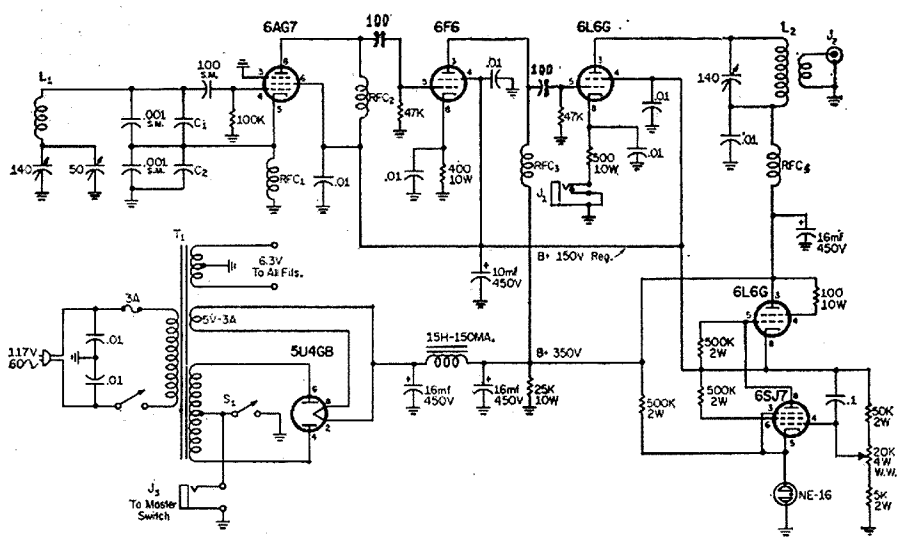


Fig. 1.—Circuit of a stable v.f.o. for operation in the 80 or 40 metre bands. Switch S1 can be paralleled through J3 for break-in operation. All capacitors are in pF. unless otherwise noted. All resistors are ½ watt unless otherwise indicated.

C1—39 pF. (N750).
C2—20 pF. (N750).
L1—B. & W. 160 metre coil.
L2—B. & W. 80 metre 75w. coil.
RFC1 to RFC4—2.5 mH., 100 mA.
T1—375-0-375 v. at 200 mA. approx., 6.3 v. at 4 amps., 5 v. at 3 amps.

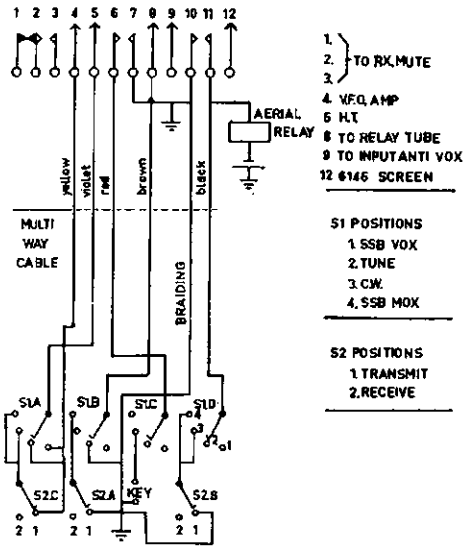
VICEROY MARK I. AND CONTROL UNIT

A. M. CREWTHER,* VK3SM'T

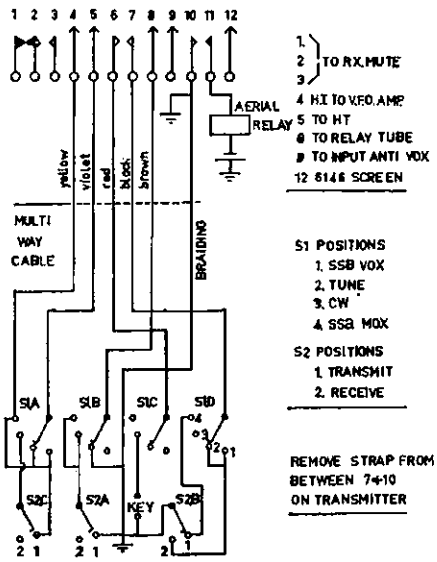
Recently I had the job of assisting to put a Viceroy Mk. I. s.s.b. transmitter on the air and struck several problems when it came to connecting up the control box which has four positions: (1) s.s.b. vox, (2) tune, (3) c.w., (4) s.s.b. mox, and also a second switch for transmit and receive.

The following faults were noted: (a) the transmitter could not be netted on s.s.b. mox or c.w., (b) when switched to c.w. the transmitter could not be keyed.

The accompanying drawings show the original circuit as supplied with the control unit and the modified unit. These modifications consist of:—



KW VICEROY ORIGINAL CONTROL UNIT.



KW VICEROY MK.I. MODIFIED CONTROL UNIT.

(1) On switch bank S1A, cut the strap between bank contacts 3 and 4, tie 4 to 1 and 2, and connect master contact of S2C to S1A, 3. (This permits netting to take place on all modes but c.w.) If netting is required on c.w. strap 4 and 5 on the terminal strip of the transmitter, but this is not recommended as any leak-through will be noticed in the receiver.

(2) On bank S1B strap 3 and 4. This turns the transmitter on for c.w. when S2 is operated to transmit.

(3) On bank S1D strap 1 and 2 and tie to tag 2 on bank of S2B.

(4) On bank S1D cut strap between tags 3 and 4 and connect the external wire on to tag 4.

(5) On S2B remove wire from master contact of switch.

(6) On S2B remove earth from bank contact 1 and connect to the master contact.

(7) On S2B connect wire, removed from master contact in step 5, to bank contact 1.

(8) Remove the strap from terminal 7 to 10 on back of the transmitter.

(9) Shift the black wire of the cable from terminal 11 to terminal 7 on back of the transmitter.

In the circuit diagrams the relay contacts shown filled in are normally made with the relay inoperative, and the contacts shown open are normally open.

This completes the modification and the transmitter will now do all the things that the control box said that it should.

I have since modified my own transmitter to this circuit (when purchased I did not get a control unit) and have had no trouble.

Also, if the 6870 crystal oscillator for the last conversion stage fails, a 6BX6 may be substituted. This calls for cutting the strap between pins 4 and 5 of the socket, removing the wire from pin 6, and fitting it to either 4 or 5 (the one that does not have a wire on it). This modification changes the filament connection to that of a 6BX6, all other elements are in similar position. Also a 6BX6 is already in the unit so this reduces the number of tube types. ●

* 28 Reynolds Pde., Pascoe Vale South, Vic.

SUBSCRIPTIONS

● Please pay your Subscriptions PROMPTLY when due. Failure to do so may result in the loss of valuable issues of "Amateur Radio." High costs of production make it necessary to limit the number of extra copies printed each month.

Book Review

ELECTRONIC CIRCUITS HANDBOOK
By Tom Kneitel, WB2AAI

This book is divided into eleven sections, all of interest to Amateurs, who are interested in circuits that work, without going into lengthy details as to why. For an American publication, there is very little in the way of kilowatt equipment, but plenty of low power, even by Australian standards, making it a useful book for those interested in gadgetry for mobile or portable work.

A good buy at 36/6 per copy, posted.

Our copy from McGill's Authorised Newsagency, 183-185 Elizabeth St., Melbourne, Vic.

☆

MEET XE1CE

Carlos Gonzalez Nejera, Snr., XE1CE, P.O. Box 66581, Mexico, D.F., Mexico.

Carlos is 54 years old, married, has two sons (Radio Hams themselves, XE1AZ and XE1GJ). Carlos is a chemical and metallurgical engineer. He has worked for about ten years in the mining industry in South Mexico. For almost 25 years in refineries in the oil industry. At present Carlos is in the group in charge of Petrochemicals. Mexico, incidentally, produces 350,000 barrels a day in 14 modern refineries. Carlos regularly corresponds with VKs. Very active on s.s.b., Carlos uses HT37, SX117 and SX111, and this feeds into a 3 element Yagi. Carlos considers himself very lucky to posses no less than 50 international certificates, some of which include D.X.C.C., B.E.R.T.A., T.P.A., and C.H.C. The award which has been his pride and joy hangs proudly in his library, is none the less than the W.A.V.K.C.A. award. Congrats. Carlos, our mutual hobby is a better hobby through men like you.—Bert, VK5BB.

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff.

Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.

Please address all articles to the
EDITOR "A.R.,"
P.O. BOX 36,
EAST MELBOURNE, C.2,
VICTORIA.

REMEMBRANCE DAY CONTEST, 1964

A handsome perpetual trophy is awarded annually for competition between States, inscribed with the names of those who made the supreme sacrifice, and so perpetuating their memory throughout Amateur Radio in Australia.

The name of the winning Division each year is also inscribed on the trophy. In addition, the winning Division will receive a suitably inscribed framed photograph of the trophy.

Objects

Amateurs in each Call Area (this includes those in Australian Mandated Territories and Australian Antarctica) will endeavour to contact Amateurs in all other Call Areas (VK1 and VK2 are to be considered to be in the one Call Area; likewise VK5 and VK8).

Date of Contest

Saturday, 15th August, and Sunday, 16th August, 1964.

Duration

From 1800 hours E.A.S.T., 15th August, to 1759 hours E.A.S.T., 16th August, 1964. A period of 15 minutes' silence will be observed by all stations on 15th August, immediately prior to the beginning of the Contest, when an appropriate broadcast will be made and relayed from Divisional Stations.

RULES

1. There shall be four sections to the Contest:—
   (a) Transmitting Phone.
   (b) Transmitting C.w.
   (c) Transmitting Open.
   (e) Receiving Open.

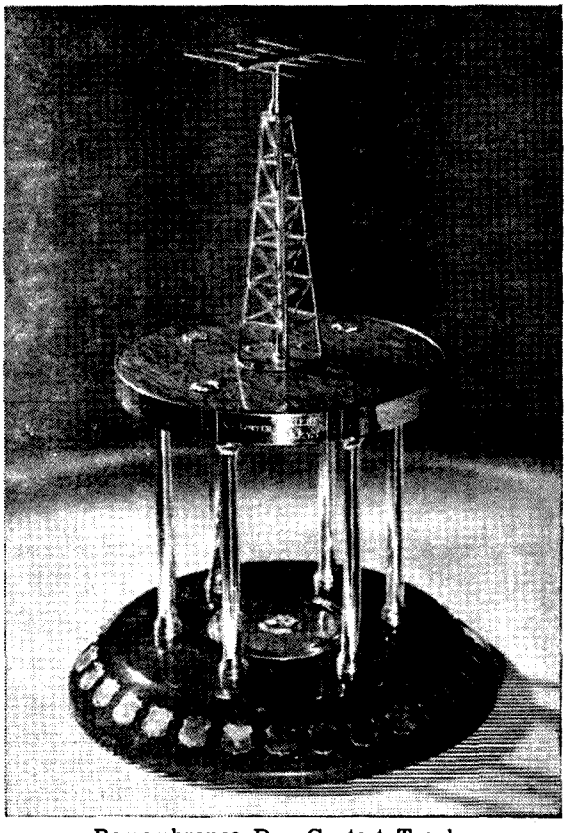
2. All Australian Amateurs may enter the Contest whether their Stations are fixed, portable or mobile. Members and non-members of the W.I.A. will be eligible for the awards.

3. All Amateur frequency bands may be used, but no cross-band operations are permitted.

4. Amateurs may operate on both phone and c.w. during the Contest (e.g. phone to phone, c.w. to c.w., or phone to c.w. and vice versa), but may submit an entry for one only of the above Sections listed in Rule 1.

An Open log will be one in which points are claimed for both phone and c.w. transmissions.

• The Federal Contest Committee of the Wireless Institute of Australia wishes all Australian Amateurs and Short Wave Listeners to participate in the Annual Contest which is held to perpetuate the memory of those Australian Amateurs who gave their lives for their country during World War II. It is held on the week-end nearest to 15th August, the date on which hostilities ceased in the South West Pacific Area.



Remembrance Day Contest Trophy

A contestant transmitting on phone, but receiving on c.w. must enter for the phone section (and vice versa). Refer to Rule 11 concerning entry in logs.

5. Only one contact per station per band is allowed and arranged schedules for contacts on other bands is not permitted.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

Contestants operating Club Stations other than their own shall be referred to, for the purpose of these Rules, as "substitute operators". Their operating procedure shall be as follows:

Phone contacts: Substitute operators will call "CQ Remembrance Day" followed by the call sign of the station they are operating and the word "log" followed by their own call sign.

C.w. contacts: Substitute operators will call "CQ RD de" followed by the group call sign comprising the call sign of the station they are operating, an oblique stroke, and their own call sign.

Contestants receiving signals from a substitute operator will qualify for points by recording the call sign of the substitute operator only.

7. Entrants must operate within the terms of their licences.

8. **Cyphers.**—Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (c.w.) reports plus three figures starting from 001 for the first contact and which will increase in value by one for each successive contact. If any contestant reaches 999, he will start again with 001.

9. Entries must be set out as shown in the example, using **only one side** of the paper, and wherever possible standard W.I.A. Log Sheets should be used. Entries should be clearly marked "Remembrance Day Contest, 1964" and must be postmarked not later than 20th September, 1964, and addressed to the **Federal Contest Committee, W.I.A., Box 638J, Brisbane, Queensland.**

Your log could help your Division to win the R.D. Contest Trophy.

SCORING TABLE

From \ To	VK0	VK1-2	VK3	VK4	VK5-8	VK6	VK7	VK9
VK0 ..	–	6	6	6	6	6	6	6
VK1-2	6	–	1	2	3	5	4	6
VK3 ..	6	1	–	3	2	5	4	6
VK4 ..	6	1	2	–	3	6	5	4
VK5-8	6	2	1	3	–	5	4	6
VK6 ..	6	1	2	4	3	–	5	6
VK7 ..	6	2	1	4	3	5	–	6
VK9 ..	6	1	2	3	4	5	6	–

Note.—Read table from left to right for points for the various call areas.

EXAMPLE OF TRANSMITTING LOG

Date/ Time E.A.S.T.	Band	Emission	Call Sign	RST Nr. Sent	RST Nr. Rcvd.	V.h.f. Bonus	Points Claim.	—

Note.—Standard W.I.A. Log Sheets may be used to follow above form.

EXAMPLE OF RECEIVING LOG (VICTORIAN S.W.L.)

Date/ Time E.A.S.T.	Band	Emission	Call Sign Heard	RST Nr. Sent	RST Nr. Rcvd.	Station Called	V.h.f. Bonus	Points Claim.	—
Aug. '64									
15 1803	7 Mc.	A3	VK5XU	59001	—	VK3XU	—	2	—
15 2349	,,	,,	VK6RU	56005	—	VK4YZ	—	5	—
16 1200	52 ,,	,,	VK2OP	43026	—	VK9PA	25	1	—

Note.—Standard W.I.A. Log Sheets may be used to follow the above form.

10. Scoring will be based on the table shown.

In addition a bonus of 25 points may be claimed for the first contact in each call area on 52 Mc. or above.

11. All logs shall be set out as in the example shown and in addition will carry a front sheet showing the following information:

Name ..... Section .....

Address ..... Call Sign .....

Claimed Score .....

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the Contest.

Signed .....

Date .....

All contacts made during the Contest must be shown in the log submitted (see Rule 4).

Entrants in the Open Section must show phone and c.w. contacts in numerical sequence.

12. The right to disqualify any entrant who, during the Contest, has not observed the regulations or who has consistently departed from the accepted code of operating ethics.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No disputes will be entered into.

14. Certificates will be awarded to the winners of the phone, c.w., open and receiving sections in each call area (Northern Territory and A.C.T. will both count as separate call areas). There will be no outright winner for Australia. Further Certificates may be awarded at the discretion of the Federal Contest Committee.

The State to which the Perpetual Trophy will be awarded shall be determined in the following way.

To the average of the top six logs shall be added a bonus arrived at by adding to this average the ratio of logs entered to the State Licensees multiplied by the total points from all entries.

Example:

$$\text{Average of the top six logs} + \left(\frac{\text{Logs Entered}}{\text{State Licencees}} \times \frac{\text{Total of Points}}{\text{from all Entrants}}\right)$$

Acceptable logs shall show at least five valid contacts.

The Trophy shall be forwarded to the winning State in its container and will be held by that State for a period of twelve months.

Note.—The F.C.C. emphasises the need for strict observance of Rule 9 in the Transmitting Section and Rule 3 in the Receiving Section.

RECEIVING SECTION

1. The Receiving Section is open to all Short Wave Listeners in Australia, but no transmitting station may enter.

2. Contest times and loggings of stations on each band are as for transmitting.

3. All logs shall be set out as shown in the example. Logs must show first the call sign of the station calling (not the station being called), the serial number sent by it and then the call sign of the station being worked. The scoring table to be used is the same as that used for transmitting and points must be claimed on the basis of the State in which the receiving station is located. A sample is given to clarify the position.

It is not sufficient to log a station calling CQ, nor is it permissible to log a station in the same call area as the receiving station.

For purposes of the Contest, VK1 and VK2 are considered to be the same call area, likewise VK5 and VK8.

4. A station heard may be logged once on phone and once on c.w. for each band.

5. Club receiving stations may enter for the Receiving Section of the Contest, but will not be eligible for the single operator award. However, if sufficient entries are received a special award may be given to the top receiving club station. All operators must sign the Declaration.

6. Awards. — Certificates will be awarded to the highest scorer in each call area. Further Certificates may be awarded at the discretion of the Federal Contest Committee.

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VK-ZL-Oceania DX Contest, 1964

This Contest will be conducted in October. The phone section of 24 hours will commence at 1000 GMT on Saturday, 3rd October, and conclude at 1000 GMT on Sunday, 4th October. The c.w. section of 24 hours' duration starts at 1000 GMT, Saturday, 10th October, and finishes at 1000 GMT, Sunday, 11th October. Full details will appear in the next issue of "A.R."

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5th All Asian DX Contest

1. Contest period: 1000 G.M.T. August 29. to 1600 G.M.T. August 30, 1964. (During the last week-end of August every year.)

2. Contest Call: Non-Asian stations call "CQ AA". Asian stations call "CQ Test".

3. Bands: The following Amateur bands may be used. 1.8, 3.5, 7, 14, 21 and 28 Mc.

4. Type of Emission: C.w. only.

5. Entry Classifications: (a) single band single operator; (b) multi band single operator.

6. Serial Numbers: (a) For OM stations: Five figures, RST report plus two figures denoting your age. (b) For YL stations: Five figures, RST report plus the two figures "00".

7. Point and Multiplier: For Non-Asian Stations: A contact only with an Asian Station will count one point and a multiplier of one for each Asian country worked on each band.

8. Scoring: (a) The score of each single band is the total contact points on that band multiplied by the total number of countries worked; (b) The multi band score is total of contact points on all bands multiplied by the sum total of countries worked on all bands.

9. Awards: Certificates will be awarded to the following operators in each country: (a) For single band entry, the highest scoring operator on each single band; (b) for multi band entry, the three highest scoring operators.

10. Special Award: In addition, a souvenir will be awarded to the highest scoring single operator on multi band in each continent. Depending on the number of the contestants in each country, the contest committee will consider more certifications.

11. Reporting: All logs must be mailed to: J.A.R.L. Contest Committee, P.O. Box 377, Tokyo Central, Japan, to arrive not later than 30th November, 1964.

For sample log format and other info apply to W.I.A. Federal QSL Manager, Ray Jones, VK3RJ.

Publications Committee Reports . . .

From the 11th May to 8th June correspondence has been received from the following: 1JM, 1KM, 2AN, 2BZ, 2EG, 2WS, 2AKX, 3IT, 3UJ, 3WW*, 3AAU*, 3AFQ*, 3ZCK, 3ZFC*, 3ZGP, 3ZOM, 3ZTJ, 4NS, 4RW, 4ZBD, 4ZJB*, 5BB*, 5NN, 5PS, 5XB, 6NJ, 6RY, 6ZDB*, 7ZAS, L2211, L3042, Ian Phillips*. (Asterisk denotes technical article.)

The Committee noted that the VK5 Division agreed to omit the Divisional notes from their Bulletin and include them in "A.R.," an action all readers will no doubt appreciate. This will now mean that the VK5 scribe is, without a doubt, the most highly paid writer on the "A.R." staff, as the Publication Committee has no hesitation in adding another nought to his already magnificent salary.

The shortage of log books was discussed and it was agreed that an additional printing again be put in hand to overcome the current backlog of orders.

As no list has yet been forthcoming from the P.M.G. of new stations, change of address, etc., as required for the Call Book, it will mean that the new issue cannot be ready before August at the earliest.

The Committee have as yet not received the services of a volunteer editor for the sideband column, hence these notes are still omitted from the magazine. All readers are requested to forward notes to their Divisional correspondent for inclusion in the "A.R." Divisional notes column.

HAMILTON S.S.B. CONVENTION

THE recent Convention of single sideband operators at Hamilton (Vic.) was a great success, but it was not planned, it just happened. This was the first s.s.b. gathering in Australia, the idea for which grew from the fact that Bernie VK6KJ and his son, Kim, were coming East for a holiday in May and Bill VK5XB decided it would be pleasant to take them motoring to Melbourne via Hamilton, the home of three regular members of the 80 metre sideband "sewing circle" —Tim VK3TW, Ern VK3AEM, and Danny VK3ADD.

The idea of a meeting at Hamilton on 16th May became so popular that the Hamiltonians soon discovered that they were organising a fully fledged, but unofficial, Convention with a buffet dinner on Saturday evening, followed by a technical session the following morning.

Dudley VK2DQ brought his facilities for producing a circular letter into operation some months previously and this resulted in a roll up of 42 sidebands plus twenty or so wives, friends and children, who converged on the Western Motel, Hamilton, by about 4 p.m. for the first "fixture," viz., contacts between the many mobiles present and the G boys—G3AOO and GI6GTK in particular. There was a regular procession of "long-whipped" vehicles to a large open field at the local Agricultural College, where they spread out to a mutual separation of several hundred yards and waited for "conditions" to become right, while Tim VK3TW acted as control station at his home QTH.

The said "conditions" did not become as good as was expected, so that the contest to discover whose mobile antenna system works best on 7 Mc. DX was rather inconclusive, however everybody made contact except for Lee VK3XO and Bill VK3AHT, who moved on up to 20 metres for a good contact with Ross WA6DEX (ex-VK5AJ), home again in Los Angeles after a brief visit to Australia several weeks previously.

The main function was, of course, the dinner, which was such a friendly affair, and how could it have been otherwise as all present had spoken via radio but were discovering for the first time what the other bloke looks like, and whether voice, age and appearance in any way coincided with the mental pictures built up during the past few years. XYLs were taken to the local picture show, leaving the OMs all to themselves until supper time.

The group photograph (see front cover), taken during the evening, is published to refresh memories and give readers of "A.R." some idea of the status and integrity of this august body of sidebanders.

It is interesting to note that the average age of the gathering is well and truly on the "shady" side of 40 years, and that more than half of them had built their own equipment, although many now use commercial gear. This represents a vast pool of radio experience—keen Amateurs who have run the whole gamut of radio from c.w., through a.m. and v.h.f., finally reaching the s.s.b. stage.

On Sunday morning, 17th May, a short technical symposium was held at the Bowling Club, when three speakers presented lecturettes, and morning coffee provided a welcome interlude.

Geoff VK3AC spoke on methods of eliminating ignition and other electrical noises in motor vehicles and came to light with some truly inexpensive, but effective remedies which have not been published previously.

Phil VK5NN gave a brief dissentation on linear amplifiers with the unit described in May "Amateur Radio" on display.

Arie VK2AVA concluded with an excellent outline of the recent trends in the development of s.s.b. transceivers, and had a "Galaxy" transceiver there on display, as a typical modern product of the U.S.A.

By midday all seemed to be going their various ways. The mobileers discovered, with some dismay, that conditions to G land were much better than they were the previous afternoon for the whip contest.

Our hosts at Hamilton—Tim, Danny and Ern—were all on the air on 80 metres during the evening to receive reports of safe arrival home, from the delegates.

We thank them all for an enjoyable and memorable gathering, which has re-inforced the old, and made many new friendships in Amateur Radio.

NEW CALL SIGNS

MARCH 1964

VK2XI—D. D. Kinnersley, 22 Foxlow St., Canley Heights.
VK2AUQ—J. Barrett, 74 Orana Court, 355 Old South Head Rd., North Bondi.
VK2AXQ—J. F. Irvine, 1a Noonleinni Crescent, Northbridge.
VK2AXV—T. L. Whateley, 116 Manchestor Rd., Cymea.
VK2AZV—G. N. Webster, 45 Grantham St., Carlton.
VK2AZY—B. A. Taylor, 9 Kairawa St., South Hurstville.
VK2AZZ—E. L. Koller, 54 Memorial Ave., St. Ives.
VK2ZAZ—J. W. Carr, Lot 5, Mackay St., Nowra.
VK2ZGF—G. R. Felser, 17 Ingalara Ave., Wahroonga.
VK3DI—A. F. Meyndarts, 662 Manneville St., Ballarat.
VK3QI—W. J. Guthrie, 17 Watsons Rd., Glen Waverley.
VK3AHY—J. Vogel, S.S. "Yarrunga," C/o. The Australian National Line, 73 Riversside Ave., South Melbourne.
VK3AKJ—R. E. Jordan, 36 Gale St., North Aspendale.
VK3ZMK—R. K. Meadows, 18 Leigh St., Huntingdale.
VK4EK—R. E. Grace, Borneo Barracks, 101 Wireless Regiment, Cabarlah.
VK4KI—D. L. Kinsella (Rev. Bro.), St. Collumbans College, Albion Heights, Brisbane.
VK4YW—G. Whitehead, 33 Fifth Ave., Bardon.
VK4ZTA—T. A. O'Brien, 729 Brunswick St., New Farm.
VK5BP—1st Gawler Scout Group, C/o. Mr. J. H. Duncan, 15 King St., Gawler.
VK5GY—T. P. Gardiner, Flat 5, 19 Fourth Ave., Ascot Park.
VK5MC—B. A. McRae, 24 Henry St., Port Pirie.
VK5MQ—A. G. Smith, 148 Yorktown Rd., Elizabeth Park.
VK5TU—A. Turton, 1 Wallira St., South Plympton.
VK5VB—V. N. Blackmore, 2 Yaralin St., Klemzig.
VK5ZFB—M. K. Gardner, 55 Regent St., Adelaide.
VK5ZHD—H. J. De Prinse, 20 East St., Hectorville.
VK5ZMC—L. N. Coventry, Lot 52, Creighton Ave., Morphet Vale.
VK6RT—J. P. Morgan (Rev. Bro.), C.B.C., Ellen St., Fremantle.
VK9CJ—C. W. Marley, Via Via Ave., Boroke, Port Moresby.

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Southern Rhodesian Radio Propagation Project

EXPERIMENTAL 50 Mc. BEACON TX

A small automatically-keyed transmitter has recently been installed on a prominent hill, some 5,000 ft. above sea level and approx. 1,000 ft. above the surrounding country, at a site 25 miles north of Salisbury in Southern Rhodesia.

The tx, which is running continuously, 24 hours per day, is unattended, but frequently monitored in Salisbury for correct operation. The frequency used is 50,046 kc., and F1 keying (f.s.k.) is used to give an upward shift of approx. 200 cycles per second on "mark".

The signal sent in Morse characters is "QRA de ZE1AZC" and this is repeated continuously, with a 36-second break of carrier every six minutes to allow receiving stations to check no-signal conditions, and to adjust automatic recording instruments. R.f. power to the antenna is of the order of 40 watts, the antenna being a vertical quarter-wave, with four evenly-spaced horizontal radials acting as an artificial ground (known in Amateur parlance as a ground-plane antenna).

The tx, which is of unique design in that the r.f. section is built into the antenna itself, is mains-operated, changing over in a few seconds to a petrol-generator supply in the rare event of mains failure.

It is intended to keep this equipment in operation through the International Years of the Quiet Sun, and reports of reception in Cyprus, South Africa and Southern Rhodesia have already been received.

All reception reports on this beacon, which will be appreciated and acknowledged, should be sent to Ivan Wood, ZE3JJ, C/o. E.S.C., P.O. Box 377, Salisbury, Sth. Rhodesia.

V H F

50 - 144 - 420 - 576 - 1296 Mc.

Sub Editor: LEN POYNTER, VK3ZGP.
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

My apologies for the notes not appearing in the June issue. I went down with a bad cold just at the critical moment and that was that. So to the latest news from Interstate, as supplied by their correspondents, which you will see from their comments all v.h.f. activity is far from dead.

Channel 0 has cast its shadow on 6 mx activity here in VK3. The main source of activity is the 53.032 Mc. a.m. net and a few starters on the 52.525 Mc. f.m. net. Some activity has been observed off these frequencies but the biggest headache appears to be able to sort out the signal you are listening to from the various spots caused by Channel 0. From reports received so far, proximity effects are quite noticeable which invariably results in the picture disappearing from the screen when the carrier goes on, to horrible black bars accompanying any modulation. We have a slight period of grace until August 1, but after that the axe will be wielded.

It is felt that vertical polarisation will be of some assistance and some filters or traps are in the process of design and construction to observe what possible effect they will have on keeping us out of Channel 0 and getting only the t.v. signal in. One effort to date eliminated only the t.v. signal. Needless to say that wasn't so hot. For the time being it will probably put quite a few of the local 6 mx gang pretty close to the 54 Mc. end and running down towards 53 Mc. to minimise the problem. So tune high, chaps.

Of course in other States the problem will not present itself but the sound on 51.75 Mc. will prove to be the highest power 50 Mc. beacon yet used. We gather that the tx is now on full power and the signal available at one location is 12 db. up on its nearest rival. So look for the Melbourne gang high in the band and hope we don't become as scarce as VK6 was for so many years..

Keep an eye on 53.032 Mc. for signals and v.f.o. onto the frequency if you hear any signals there. Quite a few on this frequency can move both transmitter and receiver. Now on to the Divisional notes. Hope to hear something from the others soon. Keep up the good work and send in results of it.—3ZGP.

VICTORIA

432 Mc. has been very active in VK3. About 16 stations have workable gear; many contacts at the moment are cross-band.

The 6 mx nets on 53.032 a.m. and 52.525 f.m., and the 2 mx nets on 145.584 and 146.00 Mc. f.m., are very active and more stations are coming on each week.

The VK3 Division V.h.f. Group are proposing to put a beacon on 145.00 Mc. If any other Divisions have suggestion for or against this proposal, they are asked to send them to the V.h.f. Group Secretary, Peter 3APJ.

Melbourne chaps on 2 mx often listen for VK2s and occasionally hear them, but are unable to contact them, so VK2s try swinging the beam down south and call CQ VK3—we will be listening for you. 73, Cyril 3ZCK.

QUEENSLAND

Although it has been quite some time since any VK4 v.h.f. news appeared in "A.R.," we now hope that we will be able to keep you up to date on v.h.f. progress in the Sunshine State.

52 Mc.: Since the loss of part of this band, activity has somewhat decreased, but the band is by no means dead. We have missed a few of the regulars of days gone by, but crystals have been ordered and shortly we should see the re-appearance of many signals. We are expecting VK4WI to resume the Sunday morning news relay on 6 mx very shortly, so be in the call back after the news.

Sound from Channel 0 in Melbourne has been frequently heard here at good strength, but although we have had our beams in the south, no DX has been reported. However, Ted 2ZFS has been working into Brisbane on regular skeds at 0730 and 1930 E.S.T. to Roy 4ZRM, who has just put up a new 50 ft. tower.

However, I must report that at fhe present time there is more regular activity on 2 mx than on 6 mx.

144 Mc.: The v.h.f'ers have been quite active on this band lately. One evening there were nine stations working in three groups. There are fairly regular skeds between Brisbane stations and Bert 4CP in Toowoomba, John 4RZ at Gatton and John 4ZWB in Dalby. John 4RZ is State Co-ordinator of the Oscar III project and can supply a signal on 144.1 or 145.9 Mc. at the flick of a switch.

A tx hunt is held on the first Friday in every month and all that is necessary to participate is a 2 mx super-regen. and a beam.

For those wishing to start up on 2 mx there is always a signal on the band at 1930 hours without fail.

Higher Bands: Two stations that I know of do have 420 Mc. gear. Tom 4ZAL has completed a tx running 4 watts output and is about to start on a rx. Norm 4ZNS tells me that he and Ken 4ZKP are about set to work each other duplex on 2300 Mc. Their main worries are over and all that is needed now is a 30 meg. i.f. strip.

General News: The monthly meeting of the V.h.f. Group in Brisbane is held in the Social Services Building, Berwick St., Fortitude Valley, on the third Friday of the month at 8 p.m. This month a lecture has been arranged by the Group. The subject will be "Interference in Radio Communications" and will be given by a member of the P.M.G's. Department (Radio Branch).

Finally, I would add that any interested person is welcome to attend the v.h.f. meetings, irrespective of whether they have a ticket or not. If you don't know any Hams, come along anyway and ask for our President Mick 4ZAA, and he will be pleased to introduce you around. —73, 4ZPL.

SOUTH AUSTRALIA

52 Mc.: Activity here seems at a lower level than when we had the 50 Mc. allocation. No DX has been reported since the new band has been in use. We understand that VK3 chaps are having a good deal of trouble from Channel 0. A new station on 52 is Kevin 4ZED. Kevin is using an 807 and a 4 el. beam. The 52 Mc. scramble held on 3rd May was won by Bob 5ZDX. Bill 5ZD and Noel 5ZAS have been heard back on the band after some time. Geoff 5ZGF has some phase modulation working quite nicely on 52 Mc., and Darryll 5ZKY is working on an all-transistorised tx to run 10w. input. This should be ideal for mobile.

General News: This month (May) was marred by the tragic death of Luke 5LL. Luke was often heard on 6 mx and was on v.h.f. back in the very early 5-mx days. A colourful and well known Institute member, he will be missed by many Hams, both in and beyond the Commonwealth.

Alf 5LA is now living in VK3 and is expected to take out a VK3 call sign soon. John 5ZDZ has been using a portable 432 Mc. converter and t.v. rx to copy the t.v. transmissions of Mait 5AO/T. Good signals have been received at distances up to 16 miles. The use of v.f.o's., especially heterodyne v.f.o's., is gaining popularity on 144 Mc. This may be an overture to Oscar III.

Bob Burns (5ZNH) has a 522 tx-rx going and is looking for contacts (144.1 Mc.). Bob is especially keen to make contacts around lunch time as the station is located at the Nailsworth Boys' Technical High School. Your conductor, Al 5ZCR, now has passed his c.w. and will soon be signing 5EK. Mick 5ZDR is building a 4X150A tx for 432 Mc. 73, Al 5EK.

WESTERN AUSTRALIA

On 30th May an attempt was made on a 432 Mc. two-way contact over 162 miles between Bluff Knoll (3640 ft.) and Mt. Williams (1589 ft.). This is some 20 miles over the radio horizon. Bluff Knoll is accessible only by a three-hour climb by foot. Those setting up the station included 6LK, 6ZDW, 6ZBT, 6ZDT, 6DP and 6ZCF. Those at Mt. William included 6ZDS and 6ZDB. A 144 Mc. link was used to set up gear. (Unfortunately the results proved to be negative. Better luck next try. Thanks for the wire, 3ZGP.)

At the last fox hunt on 16th May, 11 cars chased three consecutive foxes, ending up at 6ZDM's for supper. At the last meeting three new Amateurs were present, 6ZEE, 6ZED and 6ZEG; and a not-so-new Amateur in 6AG was elected to the Group. Finally a v.h.f. field day is scheduled for Sept. 13-14 and cross-band contacts count, so start mobilising chaps.

The beacons on 6 and 2 mx are running well and helping to set up gear for Oscar IH. On this subject, 6ZCB has a pair of helices to set up on his tower and 6ZCM is busy assembling a new converter. 73, 6ZAG.

TASMANIA

144 Mc.: Nothing extraordinary to report. New station on in Hobart is Tom 7AL, President of the Tasmanian Division.

52 Mc.: Nil activity, in the south at least, except for the broadcast of the notes for 7WI. We hope everyone will have their gear converted to the new band by the winter DX season. John 7ZJG should be a new station on the band by this time.

An idea is afoot to instal a repeater on Mt. Wellington, 4,166 ft., to work in conjunction with a 52 Mc. mobile net. This would be the first step towards State-wide coverage by v.h.f. mobiles. The next step would be the installation of a similar unit in the north, on Mt. Barrow, 4600 ft.

The annual meeting of the V.h.f. Group in May resulted in the election of the following: President, 7ZAK; Vice-Presidents, 7ZAT, 7EB; Secretary, 7ZAQ; Broadcast Officer, 7ZAX; Correspondent, 7ZAQ; Activities Committee, 7ZZ, 7ZOO, 7ZJG; Research/Records Officer, 7ZAS. 73, 7ZAQ.

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

The last month has seen much more activity on the DX bands according to reports received by the writer, and most contacts are glad to report a rise in the number of VK signals heard. Please let's keep it that way.

160 Metres: Phil 5NN reports that he has contacted, along with 3BM, ZL4LZ s.s.b. to s.s.b.; ZL2APJ on a.m. to s.s.b. W6VSS is also looking for contacts on this band. He has a very good signal and if on should be heard around 1880 kc. A sked with W6VSS was made for 12th April, and for several overs, reports of 5 by 5 were exchanged, from 0900-0930. Wale W6VSS used a 100 ft. tower and Bruce 3BM a 126 ft. vertical, supported on wooden insulators 10 ft. above ground, with 16 radials each 126 ft. long fed with 52 ohm coax. Bruce also says he is building a rx for this band only and urges all interested to prepare themselves for the next season, Sept.-Oct. On Sat., May 30, he had a test with W1SWX on s.s.b. and received S2 from near Boston. Bruce says that those who are possibly interested in this DX band should check on the A.R.R.L. for the power allowable in the different parts of the U.S.A.

80 Metres: No reports for this band received, but if the local contacts are a pointer, it appears very unstable at times.

40 Metres: Appears to be waning towards G land during the afternoons, whilst from around 0930z the W signals are workable for a couple of hours. From 1000z a few KR6, DU and JA sigs are getting through and are possibly getting stronger. Due to the QRM on this band, it is harder to make one's presence felt. With 20 metres fairly well down during the early evening, it might be an idea for those interested to notify the nearer FK8 and VR stations that quite good copy can be had on 40 metre band. Bruce 3BM reports that Arie 2AVA, while visiting Bruce's QTH, contacted WA2SFP on 7 Mc. s.s.b., long path, at Q5 S6. Jim claims this is the first long path contact on phone; the time approx. 2130 on 15/5/64. On the 18th this was repeated. On 20th at 2300z they worked again at Q5 S7. At 0000 the report was Q5 S4. WA2SFP uses Telrex Bertha which is a full size 3 el. on 40 up 85 ft. Bruce on 40 uses S line and feeds into 840 ft. vee beams, 75 ft. high at apex, sloping to 40 ft. at the open ends. Arie since returning home has also contacted WA-2SFP on the long path 40 mx s.s.b. possibly on the 20th May. Tnx Bruce.

20 Metres: During the mornings on most days, around 0130z, good signals on a.m. and s.s.b. from the South American continent, although at this time the band seems to be open to W for them, which doesn't improve our chances from here. From 0300z the central to north Americans with VE are there in their droves until approx. 0700z. Thence to KH6 and the associated islands of the Pacific. Exceptional signals are noted from KL7 at 0800z. The African continent is also heard during the p.m. hours here daily and some of the exotic calls are putting in very good signals to VK. On some nights U.S.A. can be heard calling at about 1100z, both a.m. and s.s.b. 1230z brings a few more Ws who are looking for a quicky before going to work for the day.

15 Metres: I am amazed at the lack of activity on this band, whether t.v.i. is the main cause or not. However, almost every day sigs from W are loud and clear with no QRM as on 20 mx. From 0330z-0500z signals are particularly good, but as I said there are only a few using it.

10 Metres: Garry 5ZK reports conducting one-way tests on this band with VS1LS on 16th of the month, and VS1LS reported Garry's signal 4 by 5. Garry also says that he received from W6JRY 5 by 5, but as he states he regretted that he had not finished his new 10 mx converter. Sounds very promising anyhow, tnx old boy.

ACTIVITIES

Ken 3TL reports that the biggest change at his QTH is the signals from the VE stations, which he says are of surprising strength. Ken has also worked the following stations: 14 Mc. phone—FG7XL, HZ2AMS/8Z5, VE7RN, VP6KL, VS5LX, YN1LC, ZS7R (Swaziland), 6M5MJ, 6F5UC. 14 Mc. c.w.—CR7IZ, FB9WW (Crozet), FB8YY, FR7ZD, HZ2AMS/8Z5, VE7RN, ZS7R, 5R8AI. QSLs received: KG2BX, CT1CK, CO-2HS, HC1HL, M1B, TG9RJ, VP8GQ, PZ1AX, VP1TA.

5ZC, with the installation of a 3 el. G4ZU, but at the moment fixed on stateside, reckons the band is open all the time, reports working the following: W6HLH, W2CYS, W6CBP, W6FDL, W6EKN, WA6UZB, W9SKR, W8KIT, K8IKB, K6BIA, HB9MQ. Tnx Al. Also on 40. Al holds a nightly sked with W6ULS.

Pete 5FM and myself the following: All 14 Mc. s.s.b.: XE1PJ, VE6TDJ, W7WLL, W7DXK, XE2LV, VE1CE, W0PI/KM6, W4GD, WA6OET, W7AHM, K7VCF, W0HTH, W5KAE, XE2PUN, XE2QE. A cubical quad needing attention has restricted the activities of the writer.

Garry 5ZK reports a fairly quiet month on the DX scene, although he appears to be carrying out some experiments. On s.s.b. 14 Mc. he has worked YS1JJG (0400), OA4PI (0415), HC8FN (0530), VE8AH (0915), UA0KIF (0915), VE7TD (0700), 6Y5MJ (0445), XE1CCW (0430), KL7DXK (0815), HK1ZU (0230), VP9OC (0400). 15 metres a.m.: ZS1CD (0830), W2-3-4-5-6-7-8-9-0 (0100 to 0500), 6Y5LT (0300), VS1LV (0315), ZS6AGU (0700). Also some Ws on s.s.b.

NOTES

JA6BAY can be heard nightly on 40 mx calling CQ on s.s.b. with a good signal from 300w. at approx. 7.1 Mc. 1000z.

FK8AU with VR2EQ heard on a.m. on 7080 at 0830z with sigs 5 by 6-8.

1030z UA0KKA shows up calling CQ with 5-8 on a.m., generally without much success —on 14 Mc.

VE7MD reports he has a 3 el. beam atop a cedar tree, which he has now topped and the structure will now remain at the 50 ft. level.

6Y5RD heard working with a queque on 20 mx s.s.b. at 0630z.

W0PI/KM6 puts in a beaut. sig from Midway from 0600-0830z on 14240 kc. A well travelled gent and appears interested in most subjects.

VK4JQ heard getting rid of a few QSLs to the VE fraternity on 14 Mc. s.s.b. from Willis Island.

W.A.Z. chasers are advised that UA0GF is on s.s.b. in Zone 19, and VE8RN is in Zone 2. (VK3TL).

FB8WW is quite active on about 14140 with a S7 note from Crozet Island. (VK3TL).

K2US at the World's Fair reported they are looking towards the VK-ZL area for contacts on 14 Mc. s.s.b. For card gatherers theirs should be a winner.

QTH CORNER

BV1USB—Custodian, 6214th Tac. Grp., APO140 C/o. P.M. San Francisco, Cal., U.S.A.
CE1AO—Abel Larenas T., Baquedand 450, Antofagasta.
CO2WT—Francisco Fonseca, Neptuna 902, Havana, C.
CP1CP—Imar M. Benitez, P.O. Box 2250, La Paz.
CR4AE—Flavio A. Da Cunha, Santiago, Praia C.V.I.
CT3AL—Jose Vieira, Av Zarco 14, Funchal.
DJ1BB—Erich Chowlea Klosterstra, 1, 22C Derschlag.
EA6AZ—Lorenzo Munar Pons, Marques La Cenia 28, Mallorca.
EA8BF—Manuel Cenalmor Montero, Aerodrome Los Rodeos, Tenerife.
EL3D—James A. Barnard, Owensgrove, P.O. Box 33, Harbel.
F3LI—Georges Girault, 3 Rue Victor Hugo, Bauge, Maine-et-Loire.
G6DJ—H. S. Urch, 10 Farington Rd., Henleaze, Bristol.
GM8RV—W. L. Vinicombe, 6 O'Connell St., Hawick, Roxburghshire.
HC4YS—Oswaldo Santosch, Malecon Y Ante 103, Bahia De Caraquez.
I1CWO—Giovanni Piasso, via Domodosolla 75, Torino.
JA1ANZ—K. Nagasawa, 3642 Sakura, Kumagaya, J.
LA6EF—Enar Dons, O. Delhi Gaard, Askim, N.
OA8L—Luis Meza D. Raymondi, 598 Puacallpa, Loreto, P.
OD5LX—Ted S. Truskowski, P.O. Box 1217, Beirut.
OE1HV—Hansgerd Volgsang, Gonzagagasse 9/17, Vienna 1.
PA0HI—H. Wigt, Laurens Reaalstraat 8 Bis., Utrecht.
PJ2AA—Sjoerd Heeringa, Dakota Airport, Aruba.
TF7SF—Siguron F. Jonsson, Holagata 29, Vestmanbaey, Jar.
VE8RX—George T. Kondo, C/o. Dept. of Transport, Fortsmith, N.W.T.
XE2QG—Jose R. Tristan, Escontria 55, San Luis Potosi, S.L.P.
YU1GS—Mario Vidov, Vojvode Misica 29, Belgrade.
XW8AL — Houmphant Saignasith, Statistics Dept., P.O. Box 115, Vientianne.
YN1CJ—Jose Cespedes, P.O. Box 925, Managua, N.
ZS3AC—M. D. MacGregor, C/o. C.D.M., Oranjemund, A.
5R8BI—Jean P. Hardy, C/o. S.I.C.E., Antsirabe, M.
4X4YL—Drora Friedman, Hakhalutz St., Ness Ziona, I.
5U7AB—Rene Tuaira, Garagiste, Maradi, N.
9N1SM—Samuel Mazza, via U.S.O.M./N., APO 143, Box Kat, San Francisco, Cal. U.S.A.
6W8CK—Paul Raigne, P.O. Box 971, Dakar, S.
9U5VS—R. Van Santfoort, C/o. Minetain, P.O. Box 62, Kigali, Rwanda.
9K2AN—Nasir Khan, P.O. Box 65, Kuwait.
9G1DI—R. Koehler, P.O. Box 1981, Kumasi, G.
6O2RL—H. R. Lemmon, P.O. Box 164, Berbera.

Summarising the band habits, not two days in a row can you go into the shack and know for certain that you will work the same DX station today that you worked so well yesterday at S9. Figures quoted are times of maximum signals to be received at the times quoted. Thanks to those that have their names listed above. Their notes and reports are greatly appreciated by yours truly. All times quoted are GMT unless otherwise stated.

73, Bert VK5BB.

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ZL1ALG PASSES ON

In a letter from Tony Grey in New Zealand, I was sorry to hear that his Dad, Chas Grey, ZL1ALG, had passed away during February of this year. The familiar call was no doubt worked by many in VK who shall be sorry to hear of his passing on. The late Chas. Grey had been ill for some 18 months.—Chas. Abernethy, L2211.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6RU	2	300	VK2JZ	61	211
VK6MK	43	291	VK3ATN	26	204
VK3AHO	51	284	VK4HR	12	192
VK4FJ	21	278	VK4RW	23	186

New Member:
VK2APK 64 128

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	320	VK6RU	18	260
VK3CX	26	303	VK3ARX	66	242
VK2QL	5	301	VK3AHQ	79	241
VK4FJ	29	298	VK3XB	75	235
VK3NC	19	286	VK3YL	39	231
VK2AGH	71	262	VK5RX	23	230

Amendments:

VK3RJ	42	219	VK3KS	74	177
VK2APK	76	210	VK7SM	72	160

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	8	306	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	296	VK7LZ	23	242
VK6MK	74	293	VK4HR	7	233
VK3AHO	76	287	VK3BZ	4	231

Amendments:

VK2APK	82	217	VK7SM	84	171

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

It has been a long time since I have had such a pleasant task to perform as the one which fails to my lot this month. For a long time S.w.l'ing has been at a low level in this country, due possibly to lack of interest, lack of publicity, and lack of co-operation between the listening groups in the various States. Publicity is an art, and one attribute of a good publicity man is to believe in what he is publicising as well as being active in that field. This month sees one such man taking over the sub-editorship of the S.w.l. page. The term sub-editor sounds rather formal and unfriendly, but in Chas Aberneathy I feel sure we will all meet a man who is dedicated to his job, one who is always prepared to listen to the other fellow's idea and a friend who is anxious to see listening take its place as a united effort of the various States in the interest of Amateur Radio and the W.I.A. in general. My acquaintance with Chas has been short, but in the time I have known him I have come to respect him and his opinions, and feel sure that our listening members will rally around this new spokesman as he looks after our interests. On behalf of the boys, Chas., I wish you all the best in this task, and assure you of my full co-operation in your work.—Don L2022.

* * *

Well chaps, as from this issue I shall be your scribe for a term, and trust that I can continue to do as good a job as previous writers of our page. Assistance is essential, so it would be appreciated if S.w.l's. in various States would contribute their piece to keep our page intact.

The VK-ZL-Oceania Contest will be held in October of this year—3rd and 4th phone, 10th and 11th c.w. The Jamboree of the Air again during October, whilst Oscar III. is expected to be in orbit during August. Watch "A.R." for rules, and other particulars.

A.M. PHONE RECEPTION

In reception of a.m. phone signals the normal procedure is to set the r.f. gain and i.f. gain at maximum, switch on the a.g.c., and use the audio gain control for setting the volume. This insures maximum effectiveness of the a.g.c. system in compensating for fading and maintaining constant audio output on either strong or weak signals. On occasions a strong signal close to the frequency of a weaker desired station may disappear because of reduced gain. In this case better reception may result if the a.g.c. is switched off, using the manual r.f. gain control to set the gain at a point that prevents blocking by the stronger signal.

When receiving an a.m. signal on a frequency within 5 or 20 kc. from a s.s.b. station it may be necessary to switch off the a.g.c. and resort to the use of manual gain control, unless the receiver has excellent skirt selectivity. No ordinary a.g.c. circuit can handle the syllabic bursts of energy from the sideband station, but there are special circuits that will.

An undesired carrier close in frequency to a desired carrier will heterodyne with it to produce a beat note equal to frequency difference. Such a heterodyne can be reduced by adjustment of the phasing control in the crystal filter. A tone control often will be of help in reducing the effect of high pitched heterodynes; sideband splatter, and noise by cutting off the higher audio frequencies. This like sideband cutting with high selectivity circuits reduces the naturalness of the signal tone.—Sid L2258.

NEW SOUTH WALES

At the April meeting it was decided to present a shield to the winner of the VK2 section of the R.D. Contest. This shield, suitably inscribed, is to be held for twelve months. A replica, to be kept by that person, would also be awarded. So get your gear ready for this Contest, as we would like to see all S.w.l's. submit a log.

The VK2 QSL Manager has kindly offered to send me all Inwards S.w.l. QSL cards for distribution. S.w.l's. expecting cards are asked to send a 5 x 4 envelope (stamped and addressed) to my QTH.

Don L2022 reports that there is no activity on 10, but plenty of good DX on 20, 40 and 80 metres with occasional good breaks on 15. He has logged ZB1BX, YO8CF, ZE8KI, UI8OA, CT1VB and CEAOC. Congrats on passing your service exam.

Russell L2261 is now mobile with a 8/9 Command rx with an 8 ft. whip. His home rx is a Philips No. 4. Be interested to hear of your mobile doings Russ.

Sid L2258 is having quite a ball with his AMR300. As his letter shows, an impressive list of DX received, which is too numerous to mention; nice going Sid.

Ross L2290 has received his call VK2ZKB and hopes to be calling CQ in the near future. No doubt there shall be quite a few S.w.l's. listening for you OM.

Henry L2271 has been in hospital, but is well on the mend now. He is concentrating on c.w. reception as it is good practice for future events.

Chas L2211, no listening at this QTH of late, too busy answering mail, but has received cards from YV5, JA3, VQ4 and 4X4BL.

Arnold L2291 lives at Broken Hill and uses an A.W.A. s.w./b.c. rx; on 14 Mc. has heard 32 countries, which is very good for a rx of that type. Nice going OM.

VICTORIA

Mac L3074 spent his last week-end with the VK3 boys at the Convention at Traralgon during April. He was married in Sydney in May and now lives in that area. We all wish you and your XYL every happiness Mac.

Greg L3138 has not done much listening of late owing to studies, but has received cards from ZS6, TG9, YV1, FO8, DL3, SM3, HK3, GI6, UA4, UT5, UI8. Nice work Greg, I shall pass your remarks on to Mac.

Peter Curran lives at Piangil and as a.c. is not available, uses transistor rx with quite good results. Being on a farm, Peter has plenty of space for antennae.

QUEENSLAND

Bill L4401 suggests that S.w.l's. write to one another of their doings. This seems quite a good idea as it would tend to bring one closer to fellow members. Bill uses a home-brew rx and a long wire aerial.

Lew L4020 has not been listening much of late, but is erecting a new aerial system which he hopes will improve receiving at that QTH.

Graham Shaw uses a Hallicrafters S38 rx and has only been S.w.l'ing for three months, during which time he has logged 29 countries.

SOUTH AUSTRALIA

Alan L5065 is a very keen S.w.l. and although in a noisy location seems to be doing all right so far as DX is concerned, with 106 countries to his credit. Alan uses a G5RV antenna.

WESTERN AUSTRALIA

Peter L6021, sorry I cannot help you re the Bulletin that you mention, maybe some of the VK3 boys can assist you in the matter. I would be grateful if you could let me know of your doings from time to time.

Copies of a simple circuit for a b.f.o. which can be added to your set, plus an explanation, are available. Also a time conversion chart. These can be had by request, but don't forget the stamp to cover postage. My address is 30 Urunga Pde., Miranda, Sydney, N.S.W.

To hand is a QSL card for RA 2878. It came via the VK2 Bureau and I'm trying to find an owner.

That's it for this time chaps, and I would like to thank those S.w.l's. who have written to me and trust they shall continue to do so. 73, Chas L2211.

S.W.L. DX LADDER

	Countries Conf.	Hrd.	Zns. Conf.	S.s.b. Conf.	Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	113	274	38	20	104	35
P. Drew	94	237	30	44	200	27
A. Westcott	93	159	31	9	107	11
M. Hilliard	86	285	33	34	168	12
M. Cox	80	232	31	49	163	21
G. Earl	60	150	28	32	127	6
C. Aberneathy	60	102	32	—	—	—
N. Harrison	44	119	29	4	20	35
I. Thomas	42	139	20	16	97	14
A. Raftery	14	106	15	—	—	—
R. Oats	9	26	8	—	—	—

YOUTH RADIO CLUBS

The best of the news this month is from VK3. Ken Matchett recently had the pleasure of presenting well-earned Elementary Certificates to Frank Wrobel, Greg. Smith, David Hardiment, Danny Hughes, Theo Todariv, and Joe Camerieri, all aged 10 or 11, at Gowrie Park State School. This is the first time in Australia that boys at primary school have qualified for the Elementary Certificate. Hearty congratulations to the boys, and their instructor, Bill Allen—not forgetting the head teacher, Mr. Fish, who can see the sense of this. This should open up a new line of thought for other Divisions, as well as other potential club leaders in VK3. There has been a case, I believe, of a Novice Licence being granted in the U.S. to a girl of 9 years of age. There is no doubt that a great number of boys (and girls) from 9 to 11 are capable of understanding elementary radio. Any Divisional Council that is really serious about Y.R.C. should make plans to lure not only high school teachers, but also primary school teachers. Why not at least a free A.O.C.P. course for any teacher who leads a Y.R.C.? "Use a sprat to catch a mackerel"—with apologies.

Another heart-warming piece of news from VK3 is the starting of a radio club at the Royal Victorian Institute for the Blind in Burwood Road, Burwood. The instructor is Mr. Bruce Whitehead. Ours is a wonderful hobby for the physically handicapped, and everybody knows of the cases which prove that blindness is no disqualification. Here is another line of thought for each Divisional Council: What can be done for the groups of physically handicapped young people?

You hear of Export Action on T.V.—Well, we're doing likewise. Latest news is that the R.S.G.B. has formed a committee to instigate our scheme and recommend on starting a similar one in U.K. Fullest details of our Y.R.C. have been sent to the General Manager of the R.S.G.B. and results will be interesting. Meanwhile the New Zealand A.R.T. have put Youth Radio on the agenda for this year's Convention—results also may be interesting.

We're very pleased here that two present members of our Lyneham High Y.R.C. are conducting the Saturday and Sunday transmissions for the Slow Morse Session conducted by VK2. They are Roger 1RD and Jim 1JR. They are carrying on the tradition of helping others just as they were helped.

Two active clubs I have heard of are at Homebush High (Sydney) and Christmas Is. Elementary Certificates at Homebush to P. Logan, A. Coote, I. McKechnie, D. Kavanagh, J. Cole and K. Ambler—to whom, congratulations.

On Christmas Island, they're having a lot of fun. Don Reed (ex-VK2DR, now VK9DR) has some ideas which should be of value to other leads. With Alan VK9MD and secretary Mr. K. P. S. Menon, he organises working circuit displays on peg-boards. This enables you, with many pieces of equipment, to have the simple idea of regarding the circuit diagram as a plan photograph. Breaks can easily be made to obtain multi-meter readings. Incidentally, they got more members because most visitors to their Field Day were fascinated by the pile-up of other countries wanting them as rare DX. The list of Elementary Certificate names is interesting: Ch'ng Kee Thuan, Ronald Ashley, K. P. S. Menon, Patrick Leong, Ivor Robless, Ahrone bin Arippin. More congratulations!

Calling VK7! (If you haven't been sunk. Haven't heard from you recently.) I had a chat with your Director of Education here in Canberra recently. He was quite interested in Y.R.C. Can you enlist him in the cause? —73, 1KM.

The Institute Badge
may be purchased from your
Divisional Secretary.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

AMATEUR ADVISORY COMMITTEES—1964

New South Wales
W. L. Woolnough, VK2GW
L. P. Gerity, VK2KT
N. MacNaughton, VK2ZH
G. G. Hall, VK2AGH
B. H. Anderson, VK2AND
L. McMahon (Dr.), VK2AC.

Victoria
R. A. C. Anderson, VK3WY
F. P. O'Dwyer, VK3OF
N. L. Storck, VK3ZO
R. J. Richardson, VK3ZP.

Queensland
D. M. Portley (Dr.), VK4DP
S. D. P. Smith, VK4LA
L. B. Blagbrough, VK4ZGL
C. I. Patterson, VK4YP
S. R. Baxter, VK4FJ
R. Collins, VK4XK.

South Australia
H. M. Blythe, VK5CL
R. H. Richards, VK5DO
L. D. McKenzie, VK5ZLM
E. B. Stephenson, VK5ZB.

Western Australia
J. E. Rumble, VK6RU
R. Chamberlain, VK6RY
G. S. Byass, VK6ZDS
V. J. Kitney, VK6VK
L. G. Rock, VK6LR
A. Parkes, VK6MO.

Tasmania
T. Allan, VK7AL
I. Nichols, VK7ZZ
E. Beard, VK7EB
W. Nisbet, VK7BN
D. Thorne, VK7ZAI
G. D'Emden, VK7ZAS.

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FEDERAL AWARDS

D.X.C.C.: The following are new and separate listings:—

FB8—Crozet Is.
4U1—I.T.U. Geneva.
8Z4—Saudi Arabia-Iraq N.Z.
Amend prefix 9K3 to read 8Z5.
Cancel listing of C9.

—A. Kissick, VK3KB, Manager.

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FEDERAL QSL BUREAU

Bar CR8AD advises that he is closing down from Dili around end of May and returning to Lisbon.

UB5ARTEK, often heard in VK over the past three years, is the Radio Club of the Lenin Pioneers Camp, Artek, U.S.S.R. Artek is located on the Crimean shore of the Black Sea and the Camp was established in 1958 and each summer the Camp is populated by 1,500 teenagers from the different republics of the U.S.S.R.

The L.R.E.M. of Mozambique advises details of a Contest to be held from 0001z Saturday, 1st August, to 2359z Sunday, 2nd August. Only contacts with CR7 will count and all bands and modes may be used. Full details from this Bureau.

The "Scout Radio Award" has been founded by the Scout Radio Club, Coplay, Penna., U.S.A. Contact has to be established with the Club station K3WQW and with one additional member. Full details from this Bureau.

Am happy to chronicle that at date of writing (3/6/64) well known Radio Amateur and personality, Jim Corbin, VK2YC, is making steady progress towards recovery from a severe coronary attack in April. After a spell in hospital, Jim is now convalescing at home. With further rest and "cutting his cloth to his measure," Jim should get by for many years.

Australian results of the 4th All Asian DX Contest held 1963 are: VK5NO 7170 pts., VK-2EO 1177, VK3AXK 900, VK2RA 102, VK2APK 712, VK4SD 483, VK2DI 196, VK3RJ 55, VK3IT 42 pts.

Alan Smith, ex-VK2AIR, ex-VK2AYY and VK9YY, advises he is now on from Kuala Lumpur and signing 9M2YY. Alan expects to make trips to HS and HM shortly.

The J.A.R.L. advise that they propose to give a warm reception to any Hams who are visiting Tokyo as members of the Olympic teams. They will also welcome any other Ham visitors during the forthcoming Olympald.

—R. Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

Thirty-three members, associates and visitors were present at the June meeting of the Branch, held on 5th in the Technical College. The lecture, entitled "Top Band—Without Tears," was delivered by your scribe, Keith 2AKX, ably assisted by Arie Oosterveen. The lecture concerned easy methods for 160 mx and there are spare copies of the notes for the asking—usual address, VK2AWX, Bolton Point.

Also at the meeting a tape was played of an interview between Peter Couchman, of the A.B.C., and Susan Brown, VK2BSB. This was considered by all to be very good publicity for the cause of Amateur Radio and especially for Susan who has the distinction of being the first schoolgirl holder of the A.O.C.P. She has had several contacts on 80 with local and not so local stations, but because of impending examinations for the Leaving Certificate, is wisely restricting operations. However, Susan will be on for an hour or so each week on 160 metres. The signal is very good, so please give her a call if you hear her. Jan Oosterveen, who passed the examination at the same time, has not yet received his call sign, but as soon as he does he will be on 160 as well, looking for contacts. Naturally he hopes for VK2BJO. With Bill 2ZK, Geoff 2VU and Stan 2AYF, there are now six Branch members on the Top Band. It is hoped that many more of the local chaps will take advantage of the excellent winter fade-free conditions and join us on 160 for 100 per cent. QSOs.

David VK2ZXA has managed to get some days off during the month to visit all his friends in Newcastle. He has busily copied down many of the circuits in the 2AWX library, so it could be that he is studying up for the Morse and the full ticket. There are rumours also that another member of the v.h.f. fraternity is secretly taking Morse instruction —more of this later.

David 2GF is not quite so happy since he read his call sign in the New Calls section of last month's "A.R." The point is that it was listed against the name of another Amateur. No doubt by this the error will have been rectified, but it could have been embarrassing had they met on the air. There's one thing certain, this sort of thing could never have happened to Sherwood, he's never on the air. [This unfortunate occurrence was the result of incorrect copy supplied by the P.M.G. Dept. It is presumed that the call sign should have read VK2ZGF, not VK2GF.—Editor.]

It is pleasing to report that the Cessnock Club 2AXC is now fully operational in the Civil Defence Hdq. in Main Street. The boys have an AT21 and some other powerful gear so signals should not be hard to receive from that area any more. Chris. still manages to put 2PZ on the air on Monday nights during the call backs and he has, with the help of Nev. Woods, moved several crates to make more room in the shack.

One of the best known of the old timers, Bill 2CW, has been a regular attender at recent meetings and it is good to see him back, especially as he expects to be on the air again within a few weeks. From Ron 2ASJ at Stockton comes the news that Bill 2AMM also is making a comeback and that Ron himself is in fine form. For those who are DX keen, ZP5AA, who is a friend of Ron's, is looking for VK contacts so here is your chance to get another country. Those who have not met up with Ron and 2nd op. Jack should look for them on Tuesdays either on 40 or 2 mx. If Max 2ZMO is around he will help you with more information on their haunts in the band.

Never place your trust in false prophets or for that matter false aerial halyards for if you do you may find that when you return from holidays the lovely aerial farm of a fortnight before is but a tangled wreckage on the deck. By the way, Frank 2APO now has a much improved aerial mast design, using nylon halyards!

Fred 2AEE is hiding more than his light under a bushel so it seems when one hears of his hidden aerial, 60 feet high and 700 feet from the shack. No wonder we can't see it from the road! Les 2RJ is training the new infant in the gentle art of the RJ whistle or that's what I was told. Stuart 2AYF has now completed the grand operation "get the car in the shed" and has sold the rusty one for a Mini. Won't that look good with a Top Band whip. Varley 2SF was at the meeting also last time and he hopes to be on soon. Tony 2ZCT made no rash promises, but we're waiting. Bill 2ZWM is making time to either give up smoking or get the c.w. and I think the c.w. might win this time.

I hope you haven't forgotten that Uncle Sam's birthday is one day after the next meeting and that on this occasion Lionel 2CS will be describing his crystal locked rx with the tuneable i.f. So come along on the 3rd to room 15 (or room 6), semicircular building, Newcastle Technical College, at 8 p.m. Oh! and bring your tax return! 73, 2AKX.

CENTRAL COAST ZONE

The Gosford Radio Club is grateful to Keith 2ZAU for an excellent lecture on Communication Receiver Design. The number of circuits illustrating the talk was very great and most of them should find their way into our scrapbook. Keith 2AKX also gave us some interesting sidelights on the Adelaide Easter Convention, at which he was an observer. Wally 2AXH had a couple of weeks in Concord Hospital recently concerning a poisoned finger. It is with pleasure we announce that both Wally and the finger have left hospital in one piece, better than expected at first. Quite a few Hams were able to call and cheer him up during his stay. Ernie 2EH is busy on c.w., house-painting, and stereo amplifier construction. Alec 2AAK uses number 8 fencing wire strung across the landscape. Shortly a familiar audio signal will agitate its molecules—no r.f. involved however, it's just Alec's method of getting on the twisted pair. A 4 by 13 element Yagi array is under construction for 432 megs.

Mona 2AXS featured with three other YL Hams in the evening paper recently. They were 2AIA, 2AOK and 2MR. That's half of the YL Ham population of this State, I believe, and they gathered at Hebe 2AOK's home to lay plans for further YL meetings. I believe they have designs for converting other Hani XYLs into fully fledged operators.

Harry 2LX is active on 40 mx mobile and 20 mx DX, both on the Swan 240. Major 2RU is also on 40 mobile with the HW22. Bob 2IN has re-appeared on 40 phone (a.m.) from Killarney Vale. Your scribe has had some good contacts on 20 mx with VK0GS at Wilkes, using a 40 mx (fixed) quad. Has anyone else tried using a quad on its second harmonic? A new crank-up mast with the regular 20 mx quad should shortly improve the DX position. 73, 2ON.

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SILENT KEY

It is with deep regret that we record the passing of:—

VK5LL—G. F. (Luke) Lucas

QUEENSLAND

Monthly news reports from this Division have lately been very conspicuous by their absence. Efforts are being made to overcome this and it is hoped that news from this Division will appear with greater regularity than in the past.

Divisional Council News.—The last Council meeting was held on 7th May. Reports were received from the councillors on their various activities. Our disposals officer, Paul, presented an important report. He has high hopes of obtaining coil boxes for the batch of AR7s

he has for disposal. When these coil boxes are to hand, the AR7s will be offered for ballot in the usual way.

By invitation, Chas 4UC was present at the Council meeting and he submitted an informative report to the Council on his activities to date. Chas has not been at this task very long and the results of his efforts so far show that his enthusiasm is of the utmost. He has established a Youth Radio Club at the school at which he teaches. The club operates under the call sign 4RP. He hopes to have another station operating in close proximity in July and enquiries about how to start a Youth Radio Club have come to him from several parts of the State. To his efforts we wish every success.

It has been decided to have a Divisional Dinner this year. To attract as many country members as possible, the date has been set for Friday of show week, 14th August. Members are asked to keep this date in mind and to come along in strength.

May Monthly Meeting.—The May general meeting was held at the State Service Union rooms, Elizabeth Street, City, on Friday, 22nd May. The Chairman was Peter 4PJ, our President. Several apologies were accepted, one being from Al 4LT, who is not in the best of health. Over 60 members were present and it was pleasing to see such a large number of our junior members present. An important item was raised at the meeting, namely, an organiser is required to fill the position of Civil Defence Co-ordinator for this State. Mick 4ZAA reported on the Scout venture at Nambour which was held over the Easter holiday.

After general business was dealt with, Rick 4VR produced his "Electronic Bug" cum c.w. relaying machine. Rick gave an interesting description of all the setbacks he had encountered during the many years he had been toying with the idea. Suitable components, in particular, a relay sensitive enough to follow fast c.w. keying, were difficult to obtain. Eventually he obtained, by courtesy of a VK3, a suitable relay and set to work to produce this brain child of his. He gave demonstrations of the machine operating at speeds of up to 44 words per minute.

Son Brian 4RX then got to work with the aid of sketches and gave an explanation of what happens electronically inside the little gadget. The talk and demonstration were very well received by the meeting. While not many questions were asked, it was very noticeable that practically everybody at the meeting went up after the lecture and had a close-up view of this quite unique machine. A vote of thanks was moved by Stewart 4LA and thanks to Rick and Brian was shown in the usual manner. The meeting concluded with the usual tea and "earbashings".

News of Our Members.—Claude 4UX is on holidays in Brisbane. His holiday will serve a dual purpose since while he is here, he is to give his daughter away in marriage. Librarian K. Long, 4VM, is in the south on three weeks holiday. We hope he took plenty of warm clothing as the weather here in Brisbane is quite cool. Harry 4HA has been on the ill list but latest reports say that he is on the mend and should be back soon to his old form. Stan 4SA reports that keen interest is still being shown in the A.O.C.P. Classes. In this effort, Stan is ably assisted by Sid Carter. John 4RZ, the State Co-ordinator for the Oscar III. project, is on the bands every morning on both 80 and 40 mx and on the v.h.f. band on 2 mx most evenings at 7.30 p.m. discussing this project. 73, 4ZBD.

TOWNSVILLE AND DISTRICT

Here we are again, and the conditions on the band seem to be opening up for short periods on 14 Mc. when VEs can be worked quite easily of an afternoon, not to mention many Ws. It is galling to hear the southern VKs still calling the Africans with dead silence from them in this locality.

I wonder how many of you read the article in Dec. "CQ" page 69, and did you read it fully or just glance at it and bypass the meaty question in it, always thinking that it cannot happen here. Something similar in a smaller degree did happen here. As some will recall, my letter in the Correspondence page a few years ago. With the ever poaching of the Amateur rights, we want to be on our toes. Remember the I.T.U. sits probably next year and readers of "73" will see the things that are happening in U.S.A. I think that Federal Executive should be printing something in each "A.R." of what we are doing in regard to the forthcoming I.T.U., be it ever so little.

Visitors to the shack this month included Bob 4MF, who seems interested in coming back on the air again—this time with mobile gear; also the boy from the back of beyond, Merv. 4ZMD, who has finally made the city promotion. Very keen to get into his new QTH and get started and try and use fair means or foul that the locals frequent the v.h.f. bands.

Bert 4LB returned from holidays in the capital city, where he was entertained by practically every Amateur. Speaks very highly of the club in Rockhampton and their membership of over the century.

Congratulations to Claude 4UX on the fine article in last "A.R." on the HE30. Very fine indeed, only for one horrible mistake, see end of paragraph head second column. This costs money and how? He may be one of the lucky ones.

You chaps on s.s.b. using vox, do not forget to sign the station call now and then. Remember the Regulations in this regard. Many go well over the allotted time by two or three times.

See that the VK7 Division are girding their loins and mention in last "A.R." about R.D. Contest, remembering the old battle cry "Tassie expects . . ." So you chaps prove that it wasn't a fluke by rallying around again. 73, 4RW.

SOUTH AUSTRALIA

Let the cheering, the tumult and the tom-toms cease, let the villagers return to their villages, and last but by no means least, let the Editor and the Publication Committee, with a slight tinge of red in their faces, retire to their sanctus sanctorum, let us gently lower the curtain on what has now become known as the great misunderstanding and give praise for the fact that VK5 has returned to the fold, bigger and better than ever. As a matter of fact when I finally sorted out the rumours and the rumour of rumours, and it became clear that Divisional notes were out, I immediately mounted my umbrage and went forth out into the night determined never to return, no matter how many noughts might be offered by Ye Ed. to entice me back.

The reason I finally broke down and consented to accept a couple of noughts or so added to my salary was not alone for the money, but principally because during my loss of opportunity of fighting my years-old battle with Pincott (3AFJ) he, with his usual cunning and resource, had entered my domain and was quite successfully brainwashing everyone he came in contact with as to what a champion fellow he was, to say nothing of what a lovely couple his XYL and daughter were. Joan—how could you??? When I returned from my holidays—no I did not flee the hills with the invasion of VK3 types for the Convention, despite many rumours to that effect—everybody I met went out of their way to tell me, and I quote: "My word that Ken Pincott and his family are charming people, he is so suave and dominating, and his wife and daughter took the town by storm"!!!!

Took the town by storm is right, how low can one get? I tried to tell all and sundry some of the things he has written about me, some of the terrible things he has written about the famous city of churches and pubs as he sneeringly describes us, but all to no avail, they are still "a lovely and charming family". Lovely and charming!! and the cocky came back and married the cage. Any way you look at it, it tiddley-winks, and revenge must be mine, from now on I am desecrated to—I mean dedicated to a policy of an eye for an eye and a tooth for a tooth (I can only spare one tooth), but believe me it is on, well and truly, and that is why I have returned to take up the pen and retaliate, and may the worst man lose, Pincott no less.

My little tilt in the VK5 journal at the v.h.f. boys and what about some notes, brought forth results much quicker than I bargained for. Eric 5ZEJ came back hotfoot and submitted some notes for the next edition, and if the build-up in the editorial column means anything, the notes will be a regular feature. Nice work Eric, because whether we like it or not in VK5, the v.h.f. gang certainly are a progressive and enthusiastic bunch, and at the present time are right out in front in VK5 Amateur Radio doings and that's not "squaring off" either, so why not have regular v.h.f. notes in the journal?

I noticed in the journal that Arthur 5HY has now achieved 50 years of "amateur" existence in VK5. As the paragraph went on to say, "he looks too young to have been licensed half a century ago," a statement which will be agreed to by all who come in contact with him, both on and off the air.

Joe 5ZCP from Whyalla has secured his two letter call at last and whilst the exact call is not yet known, rumour has it that he is after 5CP. Hope you get it OM, and congratulations are in order.

The Rev. R. Guthberlet, who operates the Open Door Radio Club at the Methodist Church at Mount Barker (5OD)—Bob to you—has been appointed as Co-ordinator of Youth Radio in VK5. Are you listening Ken 1KM? The next job to be done is to get all of our Youth Clubs registered with Bob and establish liaison with Rex 2YA and go from there. Try that one on your bazooka, Ken!

Well, the Convention has come and gone, and if all is to be believed, VK5 upheld its reputation of being on the ball, and no one worked harder than our genial and industrious Federal Councillor, that t.v. type, Geoff 5ZCQ, upon whose burly shoulders fell the job of handling the job of organising the whole shebang. As one who stood up in open meeting and said, when it was mooted that VK5 host the Convention, that we would fall down on the job, taking the general apathy displayed for jobs of this nature, I humbly and sincerely apologise to all concerned, and can only say in extenuation that I am happy to have been proved so bad a judge. I cannot close this paragraph without again protesting that I did not flee the hills because of the invasion of VK3s into our fair city. I repeat, I like VK3s, there is a definite place in this world for VK3s, but so far I have never been able to get the name of that place in print!

OBITUARY

G. F. (LUKE) LUCAS, VK5LL

It is with sincere regret that the VK5 Division announces the sudden passing of Gillen Frederick (Luke) Lucas, VK5LL. First licensed in February 1936, he was active on all bands up to a few hours prior to his death.

Living up to, and by, the Amateur Code, he will be missed by all with whom he came in contact both on and off the air, and to his sorrowing wife Pearl we extend our deepest sympathy in her bereavement.

The wild man from Norfolk Islands, you know, the one with a nose through his bones, Arch 5XK, is about to leave Lucindale and take up residence at the Semaphore G.P.O. Little did he think when he used to deliver telegrams from that Post Office as a lad that he would one day return as the big noise. Arch at the moment is not playing speaks with the VK5 Division because of the fact that no Divisional notes appear in the magazine. Well OM, that matter has been remedied, so what about making it up with us? Oh come on now, what about rejoining and I will try and get you on Council next year. I could make you my secret weapon for 1965. The same to you Brother!

Notice in the v.h.f. notes in the journal, oh yes I read them, if only to see just how far Eric 5ZEJ will go in patting me on the back! Anyway, I notice that "The Admiral," ex-5ZAH, has now joined the "high" types and sports the brand new call sign of 5VB. Welcome OM, and nobody has worked harder for the honor (5ZEJ please note) nor is more deserving. Nice work Vern, and hope to contact you some day. What's that? I am never on. Don't you fall for that old gag. That's some of the propaganda of Ye Ed., may his blue pencil never turn red!

Garry 5ZK now has a beaut 60 ft. tower plus piping to give him a full wavelength above ground for 20 mx (v.h.f. calculations, not mine) and if rumour is to be believed, Curl 5CL has purchased a 50 ft. tower which at the moment of writing is in the course of erection.

It has always been my policy never to intrude into the domain of the v.h.f. scribe with respect of notes or information, but for once I am going to break my rule to say that Al 5ZCR will be wearing the ball and chain this month and everybody wishes him well. Don't forget my usual admonition to those about to take the fateful step—"DX before dishes". As you start, so you finish OM. "What's that dear? I have not finished wiping up the dishes?" Oh fie upon me, how could I be so remiss. Get me, Al?

My special agent from Mount Gambier is right on the ball. Without any prior notice he assumed that I would be writing the notes for this month and came to light with the doings of the S.E. boys. If he keeps this up I will have to give him one of those noughts that the Editor is fond of handing out to me!

Stuart 5MS is on holidays at the moment of writing, and rumour has it that he is now the proud possessor of a new s.s.b. transmitter, a Japanese job, the same type as Bert 5BB is using. Erg 5KU has been making himself heard on the air with plenty of c.w., and has his beam working again. Claude 5CH is another one heard quite often on c.w. at this location. He is troubled slightly with t.v.i. on the higher bands, which must be frustrating to say the least. Col 5CJ, apart from the week-day lunch-time skeds on 7 Mc. and sometimes on 3.5 Me., has not been very active. He has given up the 6.30 a.m. sked on 144 Mc. for the winter time. I wonder why?

During my enforced absence from these pages I received several letters from a number of my readers, some of whom I knew, but several from those I did not know. To these correspondents I say thank-you, and to the unknown reader who bluntly told me to stop sulking and get on with the job, I can only plead not guilty. I never sulk—I only mount my umbrage!

One letter came all the way from Bonny Scotland, no less than GM3HOM, who will be better known to you as ex-VK5RC—Joe Reilly. He also included a copy of the "GM" magazine which is the official publication of the Radio Club of Scotland (GM3RCS). Many thanks Joe, nice to hear from you again. He said that he was missing the news of the VK5 gang in the magazine, but was at least reading a little about them in the VK5 journal. Will pass on your 73, Joe.

A welcome but perhaps unexpected visitor to VK5 recently was Ross WB6DEX), better remembered as VK5AJ and for a short while as VK3AJL. Actually he returned in a blaze of glory as Professor W. R. Adey, Professor of Anatomy and Physiology and director of the space biology laboratory at the University of California. During his five-day visit to his home town he lectured at the University and at the Royal Adelaide Hospital at the invitation of the post graduate committee in medicine of the University of Adelaide at the Royal Adelaide Hospital and also delivered the Cairns Memorial Oration in the Verco Theatre at the same address. Despite radio and t.v. commitments he found time to renew acquaintance with many of the VK5 boys, even spending quite a time on the telephone with me on a purely personal matter. All of which adds up to the fact that fame has not altered him one whit, which in my humble experience and contact with fame, is something to write about. Nice to have met you again Ross, and there is a tinge of pride in my voice as I boast to all and sundry of our many differences of opinion! Hi!

My personal agent at Port Pirie reports that the club up there is going great guns, especially the youth side of it (are you with me, Ken?). The Youth Club is now a separate set-up and meets once a week instead of the fortnight in the past. Ray 5RM is the new President, John 5ZBZ is the Vice-President, and the old work horse Bruce 5MC, ex-5ZEG, is again the Secretary. Good news to see that Bruce is now one of the squares with a two-letter call, and he has been heard on the 7 Mc. lunch-time net on several occasions. Bert 5EQ on a recent visit to VK2 (did they brainwash you Bert?) contacted Rex 2YA and tied up facilities for the club's technical advancement. This is all good news and goes to show just what can be done with an enthusiastic committee.

The news of the passing of Luke 5LL came as a great shock to the VK5 boys, as I understand that he was on the air on 3.5 Mc. only a few hours before his death. Claiming no technical ability, he simply followed the Amateur Code to the letter throughout the many years that he followed the hobby of Amateur Radio, and the many beginners that now have tickets are a mute testimony to the wholehearted assistance he has given them at a time when they needed it most, a quality that possibly many of the more technical minded boys could have emulated. A good Amateur has passed on, he will be missed by many.

Now it wouldn't do to finish these notes on such a sombre note so perhaps a few words on a somewhat unusual meeting night held by the premier Division recently. The set-up was that three intrepid members should address the meeting as to "Why they used their particular mode of transmission".

The three daredevils were Tubby 5NO, on c.w.; Al 5ZCR, on v.h.f.; and last but by no means least, our genial President (the velvet hand in the iron glove—know him?), on s.s.b. The night was a huge success, the various speakers excelled themselves in upholding the merits of their various modes, in fact at one time it looked as if we would have to call out the riot squad as Al stood with his back to the wall and repulsed attacks from right and left. Nice work fellows, you all deserve a putty medal, but you won't get one.

I was a little disappointed that I was not called upon to defend a.m., after all, it is a mode, but I succeeded in getting my share when I was called upon to propose the vote of thanks to the three speakers, and in doing so brought down the house with my explanation as to why I stuck to a.m. The simple fact is that on the first occasion I sat for my 1st class ticket I went to pieces on the code, and Johnny 5KO, who was the examiner, suggested that on the day of my encore with the code I have a good feed of peanuts, which he earnestly assured me were very good for nerves. Well, to make a short story longer, I did this and the result was that I was not game to leave the safety of my house for three days with the consequent trouble that every time I get within three feet of a Morse key I still get a reflex action that is most distressing to say the least. Therefore c.w. is out with me. S.s.b. is an unmentionable subject also, which only leaves me with a.m. —so there you are.

Phil 5NN, who had staunchly supported s.s.b. earlier, in thanking me for my closing remarks, suggested that my trouble with the dah's and the dit's, especially the dit's, made quite a moving story, and completely broke up the meeting, much to my discomfiture as I did not think for one moment that anybody present would take my remarks the wrong way! 73 de 5PS—PanSy to you.

WESTERN AUSTRALIA

These notes are the first after a long period and I hope that they will be of interest to all.

I must say that for notes to appear in "A.R." each month means that they have to be written and for them to be written requires information. This is where you as readers and subscribers to the magazine come in. If you don't pass on what you know to your scribe, then he fast exhausts his supply and then the notes disappear. After having read these notes you will realise that some information has been passed along by someone, then perhaps you can pass on something about my previous informer. Let us call it reciprocal trade.

The new Council have taken up the reins of the Division now and would appreciate any comments, suggestions, etc., be they of constructive nature or otherwise to be passed along. Maybe you have some idea which could help your Council to create interest and activity in our ranks, if so let them know.

I have been asked to convey the very warm thanks of Ed and Lefty of the U.S.S. Gridley to all Amateurs who made their stay in VK6 such a success. They only hope that their conducted tours of the ship were of interest to all participating in them and were received as part payment in return to the hospitality given to them. We realise that VK5 started something and VK6 saw it through to a very fitting close.

By now many Amateurs who are active must realise that single sideband has developed quite quickly in VK6. There are very many stations now using this mode of transmission. One should be game enough to suggest that the a.m. type of transmission should be turned on in force as a counter measure. This would at least have activity on the bands. Please do not get the idea that because I use sideband that other modes should not be used or encouraged. Let us hear you on the air, no matter what type of modulation you use.

Now we have been wondering what has become of the X group these days, but some information has leaked out. Frank 6XF seems to be following that little white ball for miles these days, maybe he finds this quite different to the big black balls ("Oh I'm sorry, Bowls") which he chases during the summer. Then we have Robbie; somehow I cannot believe that work takes up all of your time, Robbie. Then Herb 6XO, he made a trip to Perth the other week but the lust for the water saw him in Fremantle and near a certain ship gazing longingly up at something but he did have difficulty with — . . — — — — when some one stood in front of him. Maybe I could not whistle clear enough? What about something on the air from the X group?

Another thing bothers me about a well known Amateur from Narrogin who spent all one Sunday morning trying to give away a key. He finally left it in a bag in the middle of the road, only to have someone find it. Fancy him not having mobile gear with him.

Talking of Narrogin, we believe that Ian Calder passed the c.w. and is now waiting for the paper work, then he will become active. Congratulations Ian, also to you Rus if what I hear about you is correct. Rus, what arrangements have you made in the lines of extra tax or something to make up for loss of revenue by the department? After all, that nomination fee coming in regularly will be missed.

It is very good to hear some of the missed call signs showing up on the air again. Some have only been off for a few months, others for longer, but nevertheless it is good to hear them again.

I believe that the Amateur population of Esperance is to move again. We do know that one is on the way to Nauru and will be operating from about 29th June under call of VK9. Arthur 6MJ is to move to Broome in the future, which leaves the town of Esperance pretty short of Amateurs.

The boys of the northern districts seem to have gone very quiet. How about letting us hear Geraldton, Carnarvon, Derby and Milling and Moora more often?

I would like to remind VK6 Amateurs that we lost the R.D. Trophy last year, but this year we want it back. It is up to you. Work your gear, submit your logs and no one can beat us. We hope. 73, 6RY.

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TASMANIA

Won't be long now to R.D. week-end—only seven weeks to go. Hope you took my advice last month and have started cleaning out the spiders, etc. If you want log sheets, then let your broadcast officer know on the Sunday round-up and some will be despatched pronto.

The June meeting was blessed with an excellent lecture by John 7ZOO on broad-band V.h.f. Equipment as planned for the Tas.-Vic. link. His talk (which was recorded for future use) was supported by slides of various types of aerials and equipment, block diagrams, etc. Here is a man who I feel sure enjoys his work. He really got wound up and had to be reminded of the time after about an hour and a half. But nobody seemed to notice, they even returned the samples of travelling wave tubes and klystrons he brought along.

A very welcome stranger at this meeting was our old friend "Chummy" Moorehouse, a pre-war councillor for many years. Don't make it so long till your next meeting Chum!

VK7 has now got two licensed YLs. Number one of course is Mrs. J. Batchler, 7YL. Our latest addition is Anne Landers, who has taken out the call of 7ZYL. Anne, who is to be married to Michael (7ZAV) towards the end of September, sat for the A.O.C.P. exam in April for her theory, having got the Regs. at an earlier try. So far the c.w. section has eluded her, but she's going to get it, she says, even if when she goes to the exam in her wheelchair, she's only eligible for the call sign 7OW.

Looks like the Southern Zone is to lose another active member to the other end of the island as Dave 7ZAY is going to Mt. Barrow in course of duty to his employer.

Other tit bits include the fact that m.c.w. can now be heard (and read?) on 2 mx, since Ian 7ZZ has added this facility to his tx. Also Phil 7ZAX now has mobile gear in his Mini—don't know yet where he's mounted it, but knowing Phil it would be a good installation and not just a heap of gear on the back seat.

Ray 7RK is in the Repat. Hospital at time of writing. Hope you are soon your old self again Ray, and getting about like a two-year-old before too long.

Enough for now, don't forget the R.D. 73, 7ZAS.

NORTH-WEST ZONE

Last meeting was a business meeting, main points were a report on the S.s.b. Convention and the possibility of a Youth Radio Scheme in some form.

Most members are fairly active on the bands. Ken 7KH is doing much DX on c.w. and Basil 7BL seems to be getting out well of late. Reg. 7ZAO has shifted camp to a more favorable site for v.h.f. and hopes to have his beam up soon. Congrats. to Winston on obtaining his L.A.O.C.P. recently, he has already built a very nice mobile rig ready to go the minute his call sign arrives!

Not long to go to the R.D. Contest now, so all able to participate should maybe tune up the rig—some time now since it was held by VK7.

Now we have a large number of Z calls in the zone, maybe something could be done to participate in the next Oscar project? Keep it in mind, anyway. 73, 7ZBH.

NORTHERN ZONE

The usual lack of activity on the bands has continued throughout this month. The only new stations heard have been Dave and Ric, 7ZAI and 7ZAT, who were portable on Flinders Island and who regularly worked into Launceston at strength 8 to 9. John 7JF has been working DX on 20 mx on a new quad antenna and Kevin 7ZAH has been heard around Launceston with a mobile 2 mx rig. Ray 7RK has just undergone an operation in Hobart. Hope you are feeling better soon, Ray.

Bob 7ZAL is soon to come north for six months with his rig. We express a welcome to you Bob. Congrats. to Greg Power for passing the L.A.O.C.P. at the last examination. 73, Leigh Pretty.

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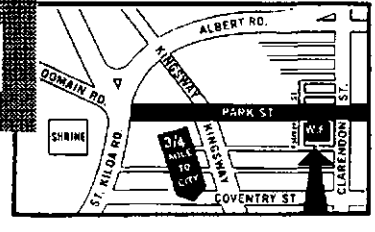

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AMATEUR RADIO

AUGUST 1964

Active YL Amateurs in the Sydney area—
Left to right: Muriel VK2AIA, Mona VK2AXS, Hebe VK2AOK, and Verle VK2MR.

Vol. 32, No. 8

2/-

Registered at G.P.O., Melbourne, for transmission by post as a periodical

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1H6	5/-	5 a £1	5R4GY	20/-		6CM5	25/-		6SN7GT	10/-		12H6	3/6	7 a £1	955	5/-	5 a £1	EF73	5/-	5 a £1
1K4	5/-	5 a £1	5Y3GB	14/6		6CW4	25/-		6SQ7GT	22/-		12J5	5/-	5 a £1	956	5/-	5 a £1	EF86	26/-	
1K5	5/-	5 a £1	5V4G	17/6		6F8	5/-	5 a £1	6SS7	7/6	3 a £1	12SA7GT	10/-		958A	2/6	10 a £1	EL41	10/-	
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72 ohm, 3/16", 35 feet 10/-.

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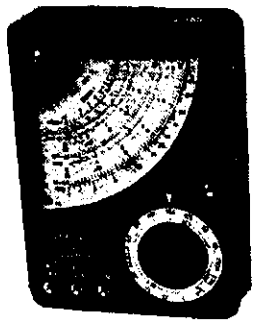

Specifications:
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10 to 365 pF. Ideal for Crystal Set. **10/- each.**

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"AMATEUR RADIO"

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★

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★

OUR COVER

First YL meeting in Australia, comprising some of the active YL operators in the Sydney area.

FEDERAL COMMENT

★

CONTEST TIME

As the month of August comes round once more, the thoughts of many Amateurs turn to Contests in general, but the annual Remembrance Day Contest in particular. Although August is still winter, its arrival indicates that spring is near and with it a general improvement in conditions on the Amateur bands—time to turn off the t.v., leave the fireside and "stoke" up the rig again.

This year is the seventeenth year the Contest has been held, and probably many of our younger generation of Amateurs were babes when the inaugural Contest was held in 1948. It is, therefore, conceivable that to them the origin and spirit behind the Contest would have been meaningless had it not been for the opening "on-the-air" ceremony and speeches by prominent Australians.

This Contest, because of its publicity, ceremony and perpetuity, has continued to maintain its popularity with youngsters and oldsters alike. It is this spirit of rivalry and participation that inspired the rules in 1948. It is most gratifying to the Executive that States continue to vie for that Perpetual Trophy which is the crowning achievement of their success.

In entering the Contest this year, you, as a participant, must assist your State by taking a little time after the Contest to mail your log—a little effort, but one that may help your State to win. Carry that sense of competition beyond the end of the Contest—the culmination of your Contest effort is the support of your State.

I.T.U. FUND

At the Sydney Convention in 1962, all Federal Councillors agreed that action should be taken at once to raise funds for the next I.T.U. Conference. The motion carried at that time has since been ratified by all Divisions, and in some Divisions, contributions have already been made.

Although this procedure is different from that used prior to the 1959 I.T.U. Conference, the need is the same. In this instance, an allocation by States has been determined, based on membership. This quota system has been used of recent years in other spheres and has proved to be very successful. We know its present application in Amateur circles will be equally well received by the membership.

Divisions should now become increasingly active in their efforts to meet their quotas, as time has an unpleasant habit of slipping quietly away. August has already been said to be competition month—let us continue this competition feeling into the I.T.U. Fund. The early filling of the Division's quota before another Division will result in an overwhelming feeling of satisfaction for a job well done.

The date of the next I.T.U. has not as yet been set, but it could be as early as 1965. It is, therefore, in the interests of the W.I.A. as a whole that subscriptions "roll in" with increasing impetus. To increase this momentum, quotas and subscriptions received will be published monthly in this journal to promote and instill that competitive spirit.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

MULLARD PREFERRED RANGE OF TRANSISTORS

For Entertainment Applications in Australia

When approaching the maximum limiting values, either electrically or thermally, the comprehensive data and curves, as contained in Volume 4 of the Mullard Technical Handbook, should be consulted.

Type Number	Description and Application	$-V_{CB}$ max (V)	$-V_{CE}$ max (V)	$-V_{EB}$ max (V)	$-I_C$ max (mA)	$-I_B$ max (mA)	T_j max (°C)	P_{tot} max T_{amb} 25°C (mW)	Outlines and Dimensions
AC125	General purpose audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	200	10	90 ■	500 ●	TO-1
AC126	High gain audio pre-amplifier and driver of the p-n-p alloy junction type	32	32	10	200	10	90 ■	500 ●	TO-1
AC127	n-p-n germanium alloy junction transistor for use in complementary Class 'B' output stages	+32	+32	+10	500	10	100 ■	280 ●	TO-1
AC128 2-AC128	High gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	32	32	10	1A	20	90 ■	550 ●	TO-1
AC132	Germanium alloy junction transistor of the p-n-p type for use in complementary Class 'B' output stages	32	32	10	200	10	90 ■	550 ●	TO-1
AC172	n-p-n low noise junction transistor of the germanium alloy type intended for use as audio pre-amplifier	+32	+32	+10	10★	10	100 ■	280 ●	TO-1
AD139 2-AD139	Medium power junction transistor of the p-n-p germanium alloy type for use in audio output stages	32	32	10	2A	200	90 ■	13 W ●	MD-11
AD140 2-AD140	Power junction transistor of the p-n-p germanium alloy type for use in audio output stages	55	55	10	3A	500	100 ■	35 W ●	TO-3
AF114N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s	32	32	—	10	1	75	50 ▼	TO-44
AF115N	Germanium transistor of the p-n-p alloy diffused type designed for use up to 100Mc/s as mixer/oscillator and for use as RF amplifier up to 27Mc/s	32	32	—	10	1	75	50 ▼	TO-44
AF116N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer/oscillator and RF amplifier up to 16Mc/s	32	32	—	10	1	75	50 ▼	TO-44
AF117N	Germanium transistor of the p-n-p alloy diffused type designed for use as mixer/oscillator and RF amplifier up to 6Mc/s	32	32	—	10	1	75	50 ▼	TO-44
OC26 2-OC26	Power junction transistor of the p-n-p germanium alloy type intended for use in audio output stages	32	32	10	3·5A	500	100 ■	12·5W ●	TO-3
OC44N	Low noise junction transistor of the p-n-p germanium alloy type for use in early stages of audio amplifiers and as mixer/oscillator in broadcast receivers	15	15	12	10	1	90 ■	43 ▼	TO-1
OC45N	Low noise junction transistor of the p-n-p germanium alloy type intended for use in early stages of audio amplifiers and in IF stages in broadcast receivers	15	15	12	10	1	90 ■	43 ▼	TO-1
OC74N 2-OC74N	High gain germanium alloy junction transistor of the p-n-p type designed for use in Class 'B' output stages	20	20	6	300	—	90 ■	550 ●	TO-1

▼ T_{amb} = 45°C ● with suitable heat sink ■ 200 hours operation ★ Typical

Modifications to Convert the COURIER FM100 TRANSCEIVER from 162 Mc. to 146 Mc.

LINDSAY DOUGLAS, VK2ON*

THIS is a frequency-modulated set of about 8 watts r.f. output, first produced in 1954. It is self contained with vibrator power supply and may be operated on 6v. or 12v. with slight alteration. A separate a.c. supply may be fed in through the 6-pin large Jones socket if the wiring is changed slightly.

1. **Ventilation**: Some sets have good openings in top and back walls of case. The writer's model needed a hole 4½" x 8" cut in top, and another 1½" x 6" in centre of back wall, then filled in with wire gauze.

2. **Circuit**: Study carefully and learn the basic outlines of same. Circuits are available from W.I A. N.S.W. Division, Box 1734, G.P.O., Sydney.

3. **Labelling**: Apart from the front panel, the components are unlabelled. To facilitate the various lining-up procedures the different items should be labelled, at least under the chassis. Typed labels were stuck on with resin glue after careful identification, e.g.—

V1—12AT7 mic. amp.
L7—9 meg.
T5—2.1 meg. (grid windings are on top).

This procedure takes an hour or two and is well worth while.

4. **Re-wire Heaters for 12v. (if necessary) as follows:—**

Fig.1.-Seven resistor strip behind front panel.

Remove earthing from A and C.
Transfer wire on B to A.
Transfer wire on D to C.

If necessary connect 25 ohm balancing resistor across A-B to equalise legs of heater chain.

5. **Re-wire Relay for 12v. and a.c.-d.c. Operation**: On 6v. the relay coils are in parallel—re-wire in series.

Insert OA210 or similar rectifier between yellow (front) wire and relay coil in correct polarity. Connect 25 μF. (or larger) 25v. working electrolytic between relay coil and chassis. It may have to be placed above the deck. This modification gave 5v. across relay, which was just sufficient to operate it.

6. **Alter Vibrator Transformer Connections for 12v. (if applicable):**

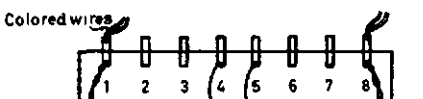


Fig.2. Eight lug strip in front of vibrator transformer.
(6V Connection shown)

Disconnect two coloured wires from 1 and transfer these to 4.

Disconnect two coloured wires from 8 and transfer these to 5.

Bridge lugs 4 and 5 with a short length of wire. The vibrator coil is connected across one 6v. leg of heater chain and causes little unbalance as it uses only 0.15 amp.

7. **Change co-ax output socket.**

8. **Instal R.f. Metering Circuit** to facilitate tuning-up of p.a. This gives tx output on meter position 2 on transmit, and **rx** "S" meter indication on receive.

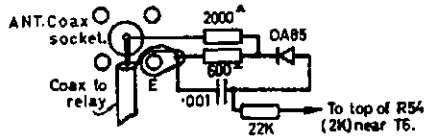


Fig.3. R.F. Metering circuit.

9. **Re-arrangement of Jones Socket** to allow operation on battery or a.c. Disconnect thin coloured wire from 1, 2, 3, 4 and insulate same.

Connect external 240v. a.c. supply to a Jones **plug** as follows:—

1. B Neg. (floating).
2. B+ 300v.
4. B+ 200v.
5. Earth and Heater.
6. Heater 12v. a.c.

On a.c. supply, the vibrator is removed from socket.

Complete internal wiring of Jones **socket** as follows:—

1. To top end of 100 ohm 5 watt resistor at back of chassis, R79 (back bias).
2. To pin No. 7 of 6X4, 300v. rectifier (K).
4. To electrolytic No. 3 (nearest back).

For mobile (battery) operation connect power via another Jones **plug** as follows:—

5. Neg. to car chassis (if polarity is correct).
6. +12v. to car battery via 20 amp. fuse in lead.

10. **Align Receiver Coils as follows:—**

(a) Fit new coils for LI and L2, using an extra turn.
(b) Remove C35 across LI.
(c) Adjust slugs of T1 and T2 to first i.f. (12.7 megs.) with g.d.o., after softening wax with the tip of an instrument-type soldering iron.
(d) Solder four inches of hook-up wire to hot end of each winding in turn —bring g.d.o. close and drape wire around g.d.o. coil. Tune appropriate slug for a dip, with g.d.o. on correct frequency. Top slug tunes grid or secondary winding. These windings may need 10 pF. additional capacity.
(e) Later, if necessary, adjust T3, T4, T5 and T6 to 2.1 megs. by coupling g.d.o. to plate of 6AN7 second mixer with a very small capacity, and tuning for max. indication on first limiter (50 microamp. meter plugged in 10X type socket on front panel, meter switch on position 2). When tuning top slug, a 5K resistor with 0.01 μF. blocking condenser must be connected from chassis to plate terminal. When tuning bottom slug this damping is connected to top of grid winding.
(f) Adjust discriminator transformer T7 on a received signal, primary for max. audio signal, secondary for best quality and least background noise.
(g) Oscillator chain: A 14.81 meg. harmonic crystal is used and L5 adjusted for max. reading on meter position 1. Check accuracy of crystal. The slug in L5 allows of some variation in frequency.
(h) L4 should be adjusted to 44.4 megs. and L3 to 133.3 megs. When receiver is working these slugs should be tuned for max. received signal.

11. **Align Transmitter Coils as follows:—**

Check C10. This should be 100 pF. Mine measured 70 pF., so I replaced it. Now align coils with the g.d.o. to the following frequencies.

Use the appropriate meter test position when touching up coils at a later stage with transmitter on.

Coil	Freq.	Test Position
L6	3 Mc.	5
L7	9 Mc.	6
L8 (2 sep. coils)	18 Mc.	7
L9	36 Mc.	8
L10	73 Mc.	9
T9 (2 coils)	146 Mc.	10
T10 (2 coils)	146 Mc.	11 or 2

Remember to soften wax with soldering iron before moving slugs. Some metal slugs will need replacing with iron ones in order to resonate at the new frequency.

12. **Crystals**: 3041.7 Kc. for **tx.**
14.81 megs for **rx.**

These may be obtained to 0.005% tolerance in various sizes for about £3 each from several sources. Small size (HC6/U or Style D) crystals will allow of channel switching later if desired. The transmitter frequency should be checked and adjusted to within 3 kc. by listening on a separate v.h.f. receiver and beating the 10th harmonic of a g.d.o. on 14.6 megs. with the 146 meg. frequency. At the same time the g.d.o. frequency is checked by heterodyning with a 100 kc. marker on another receiver at 14.6 megs. The concentric trimmer at the crystal socket

(Continued on Page 6)

* Masons Parade, Gosford, N.S.W.

GETTING STARTED ON 160 METRES

PART ONE

RODNEY D. CHAMPNESS, VK3UG*

THIS is the first of a two-part article dealing with quick and easy ways of getting started on 160 metres. In this part I will describe the transmitter I have built and am using on this band.

The transmitter has a two-stage r.f. section, consisting of a Pierce oscillator driving a pentode output stage. The modulator is also two-stage, with sufficient sensitivity for a crystal microphone to fully modulate the transmitter under close-speaking conditions.

This particular transmitter has been crystal controlled on 1825 kilocycles, which is the W.I.A. net frequency in Victoria. I believe there are crystals still available from the W.I.A. disposals. The power input to the final varies between 4 and 8 watts, depending on the h.t. voltage. I have used the transmitter with voltages between 230 and 330 volts. I would recommend not normally going over 300 volts.

The whole unit has been built into a 6" x 4" x 2" chassis, but I wouldn't recommend this unless extreme miniaturisation was the aim. A 6AB8 handles the r.f. side of the works. The circuit is quite standard. It will be noted that no r.f. choke is included in the plate lead of the triode section of the 6AB8, as it was not found necessary, plus the fact there was not enough room for it. The drive to the pentode section should be at least 1.5 mA.

The plate circuit is a standard pi-coupler with a neon in series with a 10 pF. mica capacitor to earth across the p.a. tuning capacitor. This indicates r.f. output and modulation. A 0-50 mA. meter is used to facilitate tuning and loading. The pi network values in this particular unit, with the aerial I am using, work out at 60 turns for L1 on a ¾" former, winding with 26 B. & S. enamelled wire. C1 and C2 as per parts list. C4 and C5 will vary with the type of aerial used. With the trimmer, small variations in loading can be compensated for. The plate current will vary between 15 mA. and 27 mA., depending on the h.t. voltage.

The modulator is a 6GW8 valve. The wiring of this is standard, care only being necessary with the grid lead of the triode section, which is shielded. The modulation transformer is a small replacement type centre tapped speaker transformer. The voice coil leads are not used, being taped out of the way.

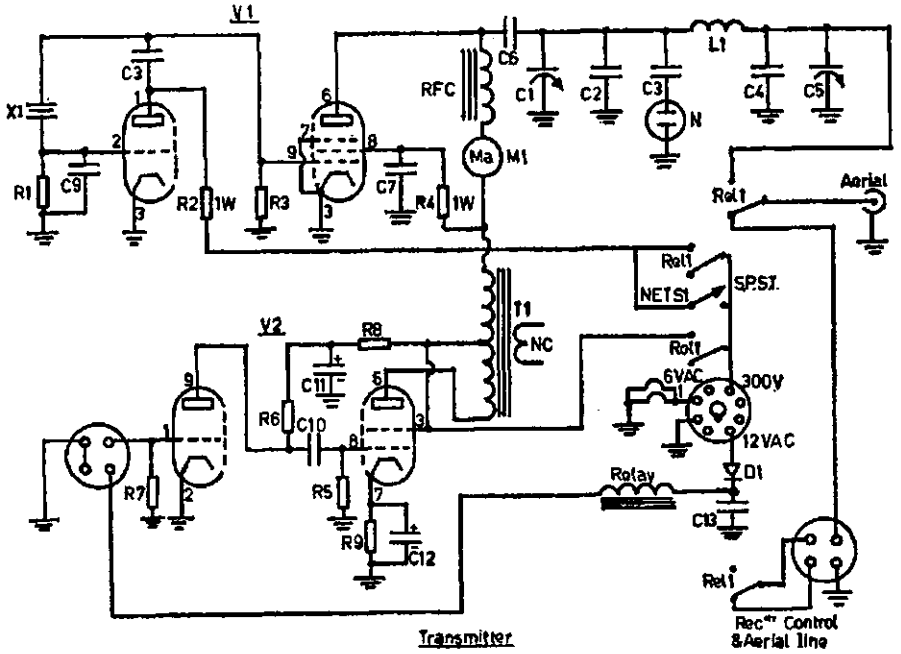
For netting purposes, a single-pole, single-throw toggle switch is used to switch the oscillator on.

To control this unit I have used a relay for the following reasons: (1) 1825 kc. is a net frequency, where press-to-talk is desirable, and (2) I had a suitable relay on hand. Instead of a relay an Oak switch can be used. The heaters are arranged in parallel across the 6-volt supply. The relay is supplied from a separate 12-volt line from the power supply. A 6-volt relay would be better here if available, so that the unit could be used with a power supply with only a 6-volt winding. The relay controls the receiver h.t. through one pair of contacts. Additional ideas for switching and power supply circuitry will be included in the concluding article.

That is the description of the transmitter. It works well, and contacts over several hundred miles have been achieved. This should be an ideal starter for 160 metres due to its simplicity and ease of operation.

The power requirements are 230-330 volts at 55-80 mA., 6.3v. at 1 amp. and 12.6v. at 0.1 amp. ●

* 5 Princes St., St. Kilda, Vic.

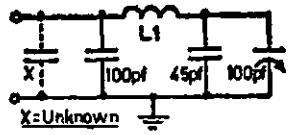


C1—10-100 pF. adjustable.
C2—200 pF. mica.
C3—10 pF. mica.
C4—470 pF. mica.
C5—20-200 pF. trimmer
C6, C7, C8, C10—0.001 μF. paper or ceramic.
C9—47 pF. mica.
C11—4 μF., 300v.w. electrolytic.
C12, C13—25 μF., 40 p.v. electrolytic.
R1, R2—47K ohms.
R3, R8—33K ohms.
R4—18K ohms.
R5—0.68 megohm.
R6—0.27 megohm.
R7—10 megohms.
R9—220 ohms.
M1—0-50 mA. meter.
RFC—small r.f. choke.
T1—Push-pull speaker transformer.
N—Small lead type neon.
S1—S.p.s.t. toggle switch.
Rel. 1—Four-pole changeover relay.
V1—6AB8 valve.
V2—6GW8 valve.
D1—HR25, 1N1763, or OA210 diode.
X1—Crystal (1825 kc.).
L1—60 turns of 20 B. & S. on ¾ inch diameter former, 1¼ inches long winding.

☆

A CAPACITY METER

HOW many fixed capacitors have you lying around the shack, just because the colour code or the markings have been rubbed off? I had about 50 of them, so I decided to do something about it. I do not claim originality of this circuit because the capacity meter was described in March 1952 "QST". The difference being, instead of using an in-built g.d.o., I decided to use the external g.d.o., which I have just completed, in conjunction with the measuring circuit.



C1—100 pF.
C2—45 pF.
C3—100 pF.
L1—Any convenient coil in low frequency range. 38 turns of 30 S.W.G. on 7/8 inch former.

If your meter is to hold calibration, reasonable care should be used to make everything solid. The frequency used is not important, mine works at approximately 4.5 Mc. and has a range of 0 to 10,000 pF.

With C1 at maximum capacity, bring your g.d.o. to close proximity and resonate to frequency of capacity meter.

To calibrate, connect capacitors of known size, or combinations thereof, and mark the dial at the grid dip point of C1. No attempt is made to give mechanical details (suit yourself). Mine was made on a small chassis with the coil protruding off the end, similar to the g.d.o. coil.

—J. T. Marston, VK4JA.

Publications Committee Reports . . .

That since the 8th June to 13th July correspondence, other than items which are printed in this issue, was received from VKs 5PS and 2RU, both being technical articles.

Current production of Log Books is still lagging the demand, so the Committee agreed to print an additional supply to that already on hand.

The question of altering the wrapper in which "A.R." is supplied was discussed and as it is not practicable to pre-print the correct return address, in the event of an incorrect addressee, it was decided to leave the current design in use. Any reader whose "A.R." is incorrectly addressed should return the old wrapper as follows: Divisional members to their Divisional Secretary; direct subscribers should return the wrapper to P.O. Box 36, East Melbourne, C.2, and in both instances the correct address should be stated on the wrapper. Any change of address should be notified as stated above, and "A.R." should **not** be notified direct. The Circulation Manager cannot alter any Divisional member's address unless the advice is forwarded through the Divisional Secretary, a matter some readers tend to forget.

The list of amended station addresses has, as yet, not been received from the P.M.G., hence production of the 1964/65 "Call Book" cannot be planned at this juncture.

Members are again reminded that all Divisional Notes, etc., should be forwarded direct to their Divisional Correspondent. In no instance should notes be forwarded direct to the Printer, as this will cause further delays and could lead to the omission of the notes. Copy for each issue must be received at P.O. Box 36, East Melbourne, C.2, on or before the 8th of the month preceding publication.

Some readers may have formed the impression that "A.R." is anti-s.s.b. Such is not the case, as a check in the annual index will show that this mode of transmission has received a very large section of the magazine space allocation. Any s.s.b. notes are welcomed, as are technical articles; in addition a sub-editor is still required to compile a regular monthly feature on sideband which was discontinued due to the fact that the previous sub-editor had to give up the task due to business commitments.

☆

ATTENTION EX-G AMATEURS!

EX-G RADIO CLUB

The Ex-G Club now has a world wide membership of exiles from the homeland. The following were recently elected to office for 1964: President W3HQO, Vice-President VO1DZ, Hon. Sec./Treas. W8YHO; Directors, VE3BQP, VE3BPV, WA4SBK, WA2EVH, W7IYW, W2PEO, ZB1A, ZS6BBB, K5QWZ. The club publishes a monthly bulletin which is mailed to all members. W3HQO will supply information on awards issued by the club. World wide club nets are in operation on 14065 kc. on Saturdays at 2100 G.M.T., and 14350 kc. on Sundays at 1900 G.M.T.

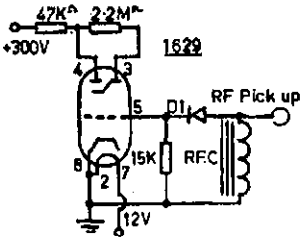
TUNING INDICATOR FOR SMALL TRANSMITTERS

M. N. O'BURTILL, VK3WW*

RECENTLY I decided to "clean up" my fixed portable rig. This included building a good modulator and bringing all controls to the front of the chassis. The rig is a modified Command transmitter which operates on 40 and 20 metres, and runs 15 watts input.

Previously I used to hook a multimeter in the h.t. lead to measure current for tuning purposes. The desire to make the transmitter self contained was strong. The shortage of a suitably small meter was evident. The lack of funds to purchase some was usual.

After much rummaging in the junk box, I decided to try the old fashioned "magic eye". The Command transmitter already has one of these (1629), used originally as a calibration check indicator.



The circuit is quite simple and easy to get going. The 2.2 megohm resistor between plate and target anode can be varied one megohm either way. Any commonly used crystal diode will work.

* 3 Maxwell St., Lalor, Vic.

I use a one-turn loop as r.f. pick-up for the grid. This has to be adjusted to suit the lay out and of course power input of the transmitter.

The valve is mounted horizontally with the key-way pointing downwards. The valve fits neatly into a 1⅛" hole lined with a grommet made by carefully stripping a few inches of cab-tyre flex and using the rubber covering as a grommet.

I have found the indicator to be more sensitive than the average meter and in view of the cheapness of the valves, I think many Hams going portable/mobile will find this indicator very handy. Naturally it will also indicate modulation, which is a useful side effect.

I still have a shorting plug in the power supply which, when removed, enables me to check plate current. However, this is only used when trying the rig on a new antenna or when fault finding. ●

☆

TELEVISION INTERFERENCE TRACED TO REPAIR TRUCKS

ROCKHAMPTON:—Stray signals sending television sets haywire in Rockhampton have been traced to radio-telephones in television repair trucks. Other signals interfering with t.v. reception have been coming from radiophones of the Capricornia Regional Electricity Board, taxis, and high tension power-lines.

Post Office inspectors investigated after viewers' complaints that pictures were shrinking, fading, and being spoiled by dark bands.

Manager of a Rockhampton television rental company said: "Some of the people who called us were really cranky. Everyone was blaming the sets."

A Post Office spokesman said that the interference had been caused by the companies operating radio-telephones on almost the same frequency as local television stations. "It has been agreed that they will operate on a different frequency in future," the spokesman said. "The changeover has started already but it might take some time to complete."

Interference has been particularly bad on the A.B.C's. Channel 3, which transmits at 85 megacycles. Some of Rockhampton's fourteen radio-telephone services are in the 84 to 85 megacycle frequency.

At Biloela, in the "fringe" area, viewers have complained that screens go blank whenever the local Capricornia Regional Electricity Board switches on its transmitter.

Mr. Lance Bickford, spokesman for Rockhampton radio and television repair men, said: "It seems a bit stiff that the companies operating radio telephones should have to carry all the cost of switching into a new wave band when they were only doing what they were told in the first place."

Mr. Bickford said the same sort of interference could be expected to some extent wherever there were channels between 0 and 3.

One solution would be to adopt the American system of not having any t.v. channels below 100 megacycles, he said.

—"The Sunday Mail," 21/6/64.

Courier FM100 Transceiver

(Continued from Page 3)

allows sufficient variation in frequency. When ordering crystals, give full details of circuit and capacities involved.

Depending on microphone output, some sets appear to have low modulation. Deviation may be increased simply by substituting 68K resistors for 22K types (R4, R6), plate load resistors of V1, 12AT7, mic. amp. If deviation is excessive distortion will be obvious.

The advantages of fixed frequency single channel operation for two metres are many. No longer do you need a panoramascope or a free-wheeling dial to discover who is on the band. Take a leaf out of the sidebanders' book and get used to push-to-talk single channel operation. With the aid of directive beam antennae, several nets can use the same channel without interference, or by switching crystals an alternative channel can be used. ●

VK-ZL-OCEANIA DX CONTEST, 1964

N.Z.A.R.T. and W.I.A., the National Amateur Radio Associations in New Zealand and Australia, invite world-wide participation in this year's VK-ZL-Oceania DX Contest.

Objects: For the world to contact VK, ZL and Oceania stations and vice versa. **Note**: VK and ZL stations, irrespective of their locations, do **not** contact each other for Contest purposes.

When? Phone: 24 hours from 1000 G.M.T. on Saturday, 3rd October, to 1000 G.M.T. on Sunday, 4th October.

C.w.: 24 hours from 1000 G.M.T. on Saturday, 10th October, to 1000 G.M.T. on Sunday, 11th October.

RULES

1. There shall be three main sections to the Contest:—
   (a) Transmitting Phone.
   (b) Transmitting C.w.
   (c) Receiving—Phone and C.w. combined.

2. The Contest is open to all licensed Amateur transmitting stations in any part of the world. No prior entry need be made. Mobile Marine or other non-land based stations are not permitted to enter.

3. All Amateur frequency bands may be used, but no cross-band operation is permitted.

4. Phone will be used during the first week-end and c.w. during the second week-end. Stations entering both sections must submit separate logs.

5. Only one contact per band is permitted with any one station for scoring purposes.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a competitor, and must submit a separate log under his own call sign. (This is not applicable to overseas competitors.)

7. Entrants must operate within the terms of their licences.

8. **Cyphers**: Before points can be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (telegraphy) report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each successive contact. Example, if the number chosen for the first contact is 021, then the second must be 022 followed by 023, 024, etc. After reaching 999, start again from 001.

9. **Scoring**: (a) **For Oceania Stations other than VK/ZL**: 2 points for each contact on a specific band with VK/ZL stations; 1 point for each contact on a specific band with the rest of the world.

(b) **For the rest of the world other than VK/ZL**: 2 points for each contact on a specific band with VK/ZL stations; 1 point for each contact on a specific band with Oceania stations other than VK/ZL.

(c) **For VK/ZL stations**: 5 points for each contact on a specific band and, in addition, for each new country worked on that band, **bonus** points on the following scale will be added:—

1st	contact—	50	points
2nd	„	40	„
3rd	„	30	„
4th	„	20	„
5th	„	10	„

For this purpose the A.R.R.L. Countries List will be used with the exception that each **call area** of W/K, JA, SM, UA will count as "countries" for scoring purposes as indicated above.

10. **Logs. (i) Overseas Stations**:

(a) **Logs** to show in this order—date, time in G.M.T., call sign of station contacted, band, serial number sent, serial number received, points, **underline** each new VK/ZL call area contacted. Separate log for each **band**.

(b) **Summary Sheet** to show the call sign, name and address (**block letters**), details of station, and, **for each band**, QSO points for that band, VK/ZL call areas worked on that band. "All-band" score will be total QSO points multiplied by sum of VK/ZL call areas on all bands, while "single-band" scores will be that band QSO points multiplied by VK/ZL call areas worked on that band.

(ii) **VK/ZL Stations**:

(a) **Logs** must show in this order—date, time in G.M.T., call sign of station worked, band, serial number sent, serial number received, contact points, bonus points. Use a **separate log for each band.**

(b) **Summary** to show—name and address in **block letters**, call sign, score for **each band** by adding contact and bonus points for that band, and "all-band" score by adding the band scores together; details of station and power, declaration that all rules and regulations have been observed.

11. The right is reserved to disqualify any entrant who, during the Contest, has not strictly observed regulations or who has consistently departed from the accepted code of operating ethics.

12. The ruling of N.Z.A.R.T. Executive Council will be final.

13. **Awards. VK/ZL Stations**: The N.Z.A.R.T. will award certificates to the top scorer on each band and the top scorer in each VK/ZL district, and silver mounted plaques to the top ZL scorers in both the phone and the c.w. sections.

Overseas Stations: Certificates will be awarded to each country (call area in W/K, JA, SM, UA) on the following basis:—

1. Top scorer using "all bands".
2. Top scorer on individual bands.
3. Other certificates may be awarded, to be determined by conditions and activity.

14. **Entries** from **VK/ZL Stations** should be posted direct to N.Z.A.R.T. Contest Manager, 152 Lytton Road, Gisborne, New Zealand, to arrive not later than 31st December, 1964.

Entries from **Overseas Stations** should be posted to N.Z.A.R.T., Box 489, Wellington, New Zealand, to arrive not later than 16th January, 1965.

RECEIVING SECTION

1. The rules are the same as for the transmitting section but it is open to all members of any S.w.l. Society in the world. No transmitting station is permitted to enter this section.

2. The Contest times and logging of stations on each band per week-end are as for the transmitting section except that the same station may be logged twice on any one band—**once on phone and once on c.w.**

3. To count for points, logs will take the same form as for transmitting, as follows: date, time in G.M.T., call of the station heard, call of the station he is working, RS(T) of the station heard, serial number **sent** by the station heard, band, points claimed. Scoring is on the same basis as for transmitting section and the summary should be similarly set out.

4. Overseas Stations may log **only** VK/ZL stations but VK receiving stations may log overseas stations and ZL stations, while ZL receiving stations may log overseas stations and VK stations.

5. Certificates will be awarded to the top scorer in each overseas scoring area and in each VK/ZL call area.

☆

1963 "CQ" CONTEST RESULTS

C.W. SECTION

Over 1,200 logs were received for the c.w. section and contained entries from 110 different countries. W1WY comments: "That just about makes this the top c.w. DX Contest in the world."

The all-band single operator section was won by 5A1TW with 871,750 points. VK6RU came eighth with 509,615 points. In the multi-operator, single tx section, VK5NO was top with 945,248 points. In single band section, on 14 Mc. VK3APJ was third with 264,775; 7 Mc. VK3XB was sixth with 16,887.

Single operator results are as follows:—

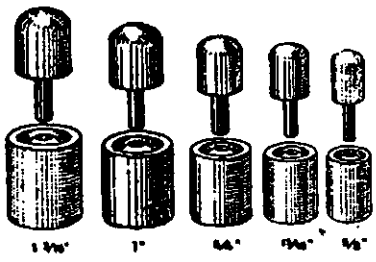
VK6RU	A	509,615	784	71	156
VK2GW	A	333,776	631	65	119
VK2PV	A	151,996	344	60	98
VK4TY	A	100,540	324	43	67
VK7SM	A	64,260	222	46	62
VK3ZR	A	40,743	183	34	47
VK2RA	A	15,126	89	24	37
VK3RJ	21	16,368	126	18	30
VK5KO	21	11,856	90	18	30
VK4SS	21	7,935	115	10	13
VK5JT	21	2,128	60	9	10
VK3APJ	14	264,775	798	33	87
VK3TL	14	92,708	346	30	68
VK2APK	14	47,520	204	31	59
VK9GL	14	32,928	239	24	32
VK5WC	14	5,811	66	17	22
VK4EL	14	4,600	38	17	29
VK3XB	7	16,887	151	16	23

PHONE SECTION

Slightly over 700 logs were received from 117 countries for this year's Contest. "A new record which just about makes this the largest Phone DX Contest in the world."

VK3ATN	A	204,800	468	62	98
VK8RU	A	87,444	251	41	85
VK4TY	A	34,310	155	31	63
VK2APK	21	3,402	68	8	10
VK3TL	14	85,202	288	33	80
VK2AHT	14	77,168	264	28	76
VK2JZ	14	20,526	122	22	44
VK5GG	14	18,720	134	20	32
VK2KM	14	17,292	93	23	43
VK3HL	14	15,228	95	19	35
VK2AUS	14	2,320	38	11	18
VK3RA	14	99	5	4	5

"WILLIS" CHASSIS PUNCHES



MADE OF FINEST GRADE TOOL STEEL

3/8 in. punch	22/-	1-1/16 in. punch	38/-
1/8 in. "	22/-	1-1/8 in. "	38/-
5/16 in. "	22/-	1-3/16 in. "	44/-
7/16 in. "	22/-	1-1/4 in. "	48/-
3/8 in "	24/-	1-3/8 in. "	52/-
11/16 in. "	26/-	1-1/2 in. "	56/-
3/4 in. "	28/-	1-5/8 in. "	60/-
7/8 in. "	36/-	1-3/4 in. "	72/-
1 in. "	36/-	2 in. "	80/-

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"Q-MAX" CHASSIS CUTTERS

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BRITISH MADE

SAVES TIME — GIVES PROFESSIONAL APPEARANCE

SIZES		SIZES	
3/8 inch	20/-	1-3/8 inch	40/6
7/16 inch	20/-	1-1/2 inch	40/6
1/2 inch	20/-	1-3/4 inch	44/1
5/8 inch	20/-	2 inch	48/-
3/4 inch	28/-	2-3/32 inch	72/3
7/8 inch	30/10	2-1/2 inch	85/9
1 inch	38/7	11/16 in. Square	58/-
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The "Q-Max" range of Screw Type Chassis Cutters serve a most useful purpose where holes are to be punched on chassis where components are already mounted. The SQUARE and RECTANGULAR punches save the hard work involved in transformer, plugs and sockets, I.F's., etc., cut-outs.

MULLARD TRANSISTOR MODULATOR KIT

12.5 Watts Output

Basic components include: IT631 input transformer, MT26 mod. transformer, five carbon resistors, semi-adjustable resistor, two OC74 transistors, two OC26 transistors, electrolytic condenser, aluminium chassis.

Price: £9/18/9 inc. S.T.

Write for original Mullard Design Data. (Refer "A.R.," May 1961.)

INSTRUMENT BOXES

Grey Hammertone Finish includes detachable front panel.

Size: 9" x 7" x 5½"	20/-	inc. S.T.
7" x 6" x 4½"	17/3	" "
5" x 5" x 4"	15/-	" "

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"Replogle" World Globes, especially designed for Amateur Stations. World Call Areas clearly marked. Includes day-night time cursor.

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WILLIS AIR-WOUND INDUCTANCES

No.	Diam.	Turns per In.	Length	B. & W. Equiv.	Price
1-08	½"	8	3"	No. 3002	5/3
1-16	½"	16	3"	No. 3003	5/3
2-08	⅝"	8	3"	No. 3006	6/3
2-16	⅝"	16	3"	No. 3007	6/3
3-08	¾"	8	3"	No. 3010	7/4
3-16	¾"	16	3"	No. 3011	7/4
4-08	1"	8	3"	No. 3014	8/5
4-16	1"	16	3"	No. 3015	8/5
5-08	1¼"	8	4"	No. 3018	10/6
5-16	1¼"	16	4"	No. 3019	10/6
8-10	2"	10	4"	No. 3907	13/9

SPECIAL ANTENNA ALL-BAND TUNER INDUCTANCE

(equiv. B. & W. No. 3907-7")

7" length, 2" diam., 10 t.p.i., 24/6

References: A.R.R.L. Handbook, 1961; "QST," March 1959; "Amateur Radio," Dec. 1959.

PRICES STRICTLY AMATEUR NET INCLUDING SALES TAX. PLEASE ALLOW EXTRA FOR FREIGHT

VALVE SOCKETS

McMurdo shock mounted:
9-pin black moulded, 5/- ea.
9-pin mica moulded, 5/6 ea.
(Ideal for mobile equipment, microphone input stages, etc.)

Fluon P.T.F.E.:
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9-pin type VH499/902 8/6 ea.
(Low r.f. loss to 500 Mc.)

Plessy Ceramic Sockets:
7-pin .... 2/- ea.
9-pin .... 2/- ea.
7-pin, with skirt .... 2/6 ea.
9-pin with skirt .... 2/8 ea.
(Prices include Sales Tax.)

CO-AXIAL NOISE SUPPRESSION CONDENSERS

Ducon Type PNC52 0.1 μF., 50v. d.c.w., 20 amps., 8/3 each inc. S.T.

Ducon Type PNC51 0.1 μF., 50v. d.c.w., 40 amps., 13/6 ea. inc. S.T.

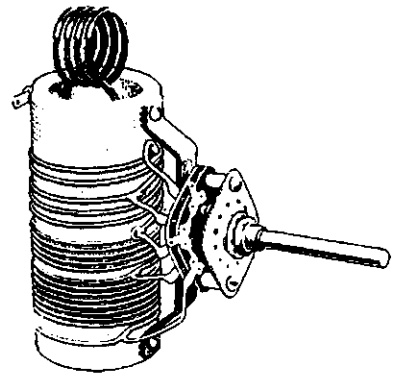
Highly effective for mobile work.

WODEN MULTI-MATCH MOD. TRANSFORMERS

UM0	10-Watt Audio		£6/6/6
UM1	30	" "	£8/5/6
UM2	60	" "	£11/9/9
UM3	125	" "	£12/8/0

Prices include 12½% Sales Tax
FREIGHT EXTRA

PI-COUPLERS



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For use up to 600 watts p.e.p. Match plate loads of 2,000 to 3,500 ohms (Z) and higher into coaxial cable. Operating Q increases on higher frequencies to increase harmonic suppression enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for wiring inductance (L). Incorporates extra switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps. at 2,000 volts with contact resistance (R) of 0.8 milli-ohms.

Price: £3/19/6 (inc. S.T.)

WILLIS PI-COUPLER CHOKE

To suit above Pi-Coupler. No resonances within Amateur bands if spaced diameter or more from metal panels. Stands 6 inches high on 1 inch diam. ceramic former. Base mounting bracket included.

Price: 25/- (inc. S.T.)

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Type 4/111 for use with parallel tubes type 6146s, 807s, etc.
Type 4/112 for use with single ended tubes type 6146, 807, etc.

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Type 817 condenser, suitable for use with input of all above Pi-Couplers. Rated 1,200 volts r.m.s., ceramic insulation, 5t space 2 inches square by 2¾ inches deep. (Output condenser normal small two or three gang b.c. condenser.)

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DUCON 20 KV. CERAMIC COUPLING CONDENSERS, 500, 1,000 pF.

Price: 12/- each inc. S.T.

SHURE S.S.B. MICROPHONES

American controlled-magnetic, hand-held, specially designed for mobile use, complete with self-coiling cable and press-to-talk switch.

Type 401A High Impedance (50K Ω)
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Price, both types: **£9** inc. S.T.

Miniature mu-metal screened and cored Microphone Transformer

50 ohm-to-grid. Suit Type 401B or any low impedance microphone 50 or 200 ohm-to-grid. One hole (3/8 inch) mounting.

Price: £3/6/- inc. S.T.

WILLIAM WILLIS & CO. PTY. LTD.

428 ELIZABETH STREET. MELBOURNE, C.1 **Phone 34-6539**

A MODERN DX RECEIVER

H. F. RUCKERT, VK2AOU*

THE writer uses the times of low sun activity to re-build his radio station. These periods seem to coincide with major developmental steps, and therefore re-building is also needed to keep up with electronic development. It was 12 years ago that the writer went d.s.b.r.c. with 400% modulation. The trouble at that time was that the few early s.s.b. operators knew how to tune in such a signal and liked the clean modulation and power of the signal, but others who could only understand the call but little else, gave it up with the remark, "Tons of audio but too much over-modulation." Frustrated, I gave up and went back to a.m. with plate and screen modulation and clipper to get a chance to work D.X.C.C. and contests. If we tune across the 20 metre band now we find that all phone QSOs, or at least 90% of the successful callers, work s.s.b.

For the writer the design, building and development of the equipment is the basic half of Amateur Radio. If we say that home construction costs too much, we seem to go about it the wrong way. If one says he can't build the gear because he has not a complete radio lab. at his disposal, he never learned Amateur techniques or he does not know enough about the job.

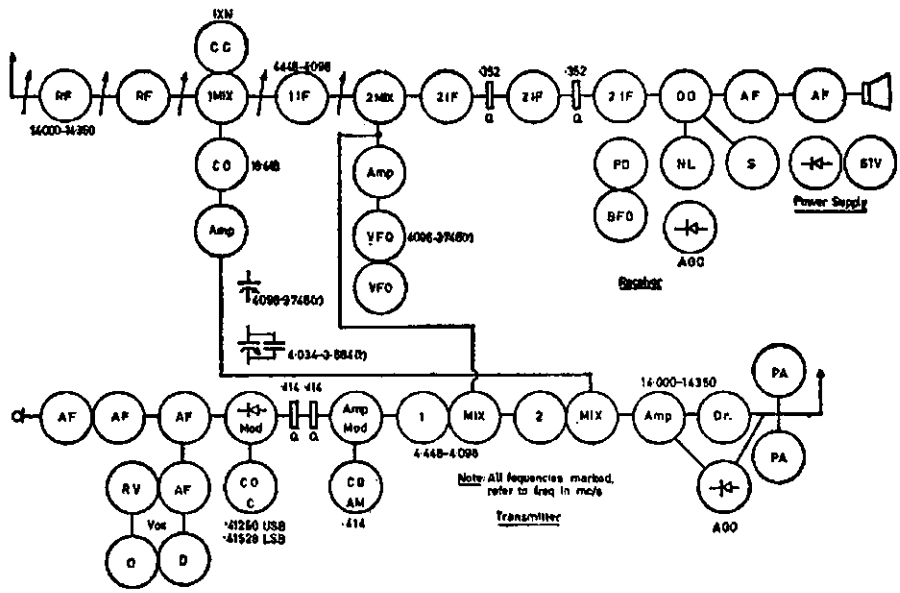
This receiver was first built about 12 years ago and many times modified, especially as far as the front-end is concerned. S.s.b. called for improved oscillator stability and this could best be obtained with crystal controlled first oscillators and a stable v.f.o. and product detector had to be again re-built. Some thought was given to possibilities of combining certain transmitter and receiver features without adopting undesirable properties of some commercially built transceivers. A certain amount of skill was required to design around mechanical and electrical problems and to make best use of the existing chassis, holes already drilled, and the old but good components and bits and pieces collected over the years. Most of these steps helped to keep the cost of the reconstruction job down to about £20. Labour is not to be looked at as an expense item but as part of the pleasure of achieving something.

THE BLOCK DIAGRAM

The block diagram shows the stages of the receiver and transmitter. The receiver has two r.f. stages. The first mixer contains a triode which is used in the 1 Mc. crystal calibrator oscillator. The first oscillator is crystal controlled and a cathode follower valve helps to obtain the matching to a co-ax cable through which the same oscillator voltage is fed to the second mixer stage of the transmitter. In this way only one set of crystals is required for the receiver and transmitter. The chance of finding one suitable set is very much greater than the chance of obtaining two sets, which can easily be brought to the correct frequencies. The frequency values shown on the diagram are for 20 metre operation.

With first oscillator frequencies above the r.f. frequencies, the first i.f. must be tuned towards lower frequencies as the r.f. values go up from 14 Mc. to 14.35 Mc. This is no problem if the first i.f. is broad banded or if separate capacitor gangs are being used as in this case.

With the first oscillator and the second i.f. at fixed frequencies, the need arises also to tune the second oscillator (v.f.o.) to lower frequencies with rising r.f. values. The second and third r.f. tuned circuits are tuned with the same gang which uses two variable capacitor sections in parallel for the v.f.o. These two segments had to be turned 180° on the axle to obtain the correct frequency shift direction for the r.f. stages and the v.f.o. The capacitor rotors were shrunk on the axle, so that warming up with the soldering iron allowed the segments to be turned 180°.



The v.f.o. is followed by a buffer stage and again the output goes to the second mixer of the receiver and also to the first mixer of the transmitter. The oscillators change first and second place from the receiver to the transmitter in order to have in both cases oscillator frequencies which are not too far away from the mixer input frequencies. In this way the image frequencies and oscillator voltages can be better rejected in the following i.f. stages, so reducing spurious signals. This method helped also to get away with only two mixers in the receiver and transmitter, which again helps to reduce the number of otherwise possible spurious signals.

The transmitter filter and carrier set of crystals has a frequency which is 62 kc. above the frequency of the receiver second i.f. filter crystals. A 5 pF. capacitor parallel to the v.f.o. transmitter gang corrects this difference. The receiver always had two identical capacitor gangs and dials, therefore it was decided to use one to tune the receiver and the other one to tune the transmitter. Two small surplus relays with ceramic insulated contacts are being used to switch the transmitter condenser or the receiver condenser on to the single v.f.o. In this way a single Franklin v.f.o. with buffer stage, one coil and one temperature compensating capacitor combination, acts for the transmitter and receiver, but the frequencies are independently adjustable over a 500 kc. range. One calibrated range covers all six bands.

Three low-gain stages with a double crystal filter follow on the second i.f. The product detector contains the b.f.o. and s.s.b. a.g.c. amplifier. For a.m. a twin diode is used. A noise limiter, S meter valve, two a.f. stages and the power supply complete the set.

The block diagram of the transmitter will be later described, after this part of the set-up is completed.

THE CIRCUIT

The r.f. part has six bands of 500 kc. each. In this way the number of crystals for the first oscillator was kept to a minimum, and the six sets of coils and trimmers of the Goerler turret could best be used. Splitting the bands up even further would have caused many electrical and mechanical problems, operating inconvenience, and difficulties in obtaining the necessary parts.

The first tuned circuit is adjusted with the aerial trimmer of 30 pF., because this trimmer is necessary in any case, and the receiver tuning gang did not have the fifth segment otherwise required. The 6BH6 valve is not connected to the a.g.c. circuit, but it may be attached to a manual gain control if

* 25 Berrille Rd., Beverly Hills, N.S.W.

cross modulation is caused by strong near-by signals.

The second and third r.f. tuned circuits are tuned with the four-gang capacitor of 6 to 18 pF. each. The required bandspread of 500 kc. at the various r.f. bands is obtained by connecting the air dielectric variable capacitor and valve electrodes to the hot end of the r.f. coils or on taps and by using the correct value of fixed and trimmer adjusted parallel capacity. The L and C values have to be precalculated, they are later preadjusted in the circuit with the g.d.o. and finally trimmed under working conditions.

The coil details are as follows:—

80 and 40 metres: No coil tap and total maximum capacity about 100 pF.

20 metre coil tap at 4/5 of turns, 100 pF. maximum total capacity.

15 metre coil tap at 2/3 of turns, 75 pF. maximum total capacity.

10 metres (1): Coil tap at half of turns, 63 pF. total maximum capacity.

10 metres (2): Same as above.

The r.f. gain of the second r.f. stage is controlled manually and also via the a.g.c. network. The first oscillator uses a 6AG5 valve, triode connected, in a well known overtone circuit. It was found that the 80 metre range crystal oscillated far more readily in the overtone circuit than in the basic frequency circuit first used. The crystals for the 40, 20 and 15 metre bands are operated at the frequency which is close to the third harmonic (I don't want to join in the argument of harmonic v. overtone), and the crystals for the two 10 metre band segments work near frequencies which are near the fifth harmonic. These two crystals will later be replaced by those which operate at a lower overtone, to obtain more oscillator voltage. They were originally for 6450 kc. and the writer ground them down with valve grinding compound on a thick glass plate.

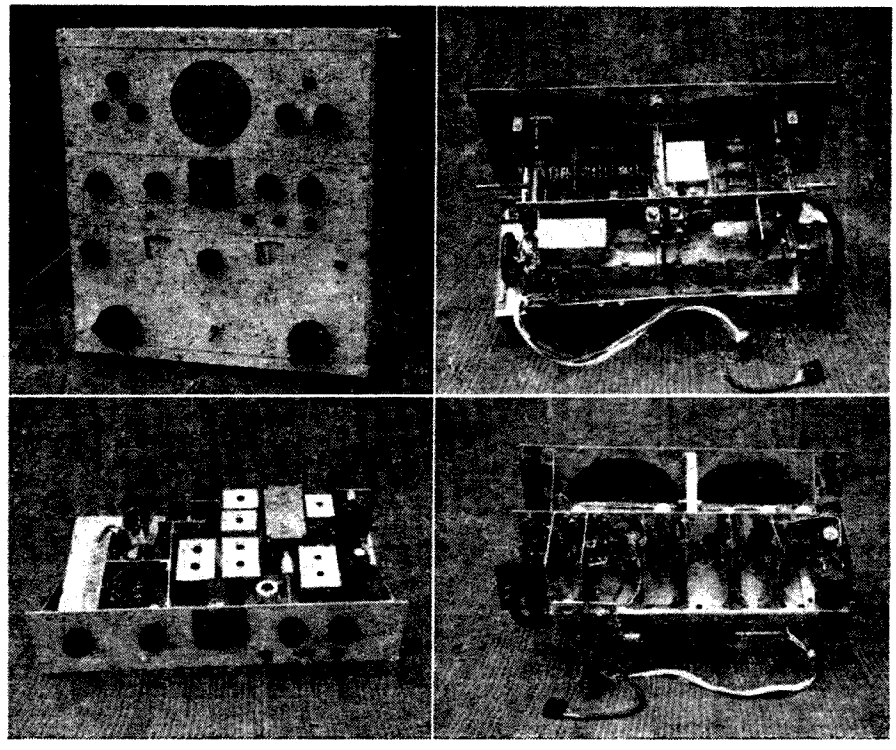
To reduce pulling effects, link coupling is used to bring the c.o. voltage to the first mixer grid. The 9002 valve acts as cathode follower from which the c.o. voltage is fed to the second mixer of the transmitter. A low Gm valve, which can take several volts of r.f. without distorting the signal, is being used here. The pentode of the 6U8 serves as first mixer, whilst the triode operates the 1 Mc. crystal calibrator. A Ge-diode causes distortion of the 1 Mc. signal and in this way strong harmonics are obtained for calibrating purposes up to 29 Mc. This calibrator gives a stable signal and is therefore also being used to check the receiver gain and bandwidth, as well as the stability and relay reliability. A 100 kc. crystal may be used if so desired.

The receiver is built on three chassis installed on top of each other in an angle iron frame. The lower or r.f. chassis contains also the first wideband i.f. filter tuned to cover the first i.f. band of 500 kc. Fixed wideband tuning was employed because tuning would have been inconvenient in this case. Great care was exercised in the design of the v.f.o. None of the components could have a great temperature coefficient, which excluded iron or ferrite coil cores or any other capacitors than fixed NPO ceramic or solid built air dielectric variable capacitors. Therefore the trimmers of the TCc differential circuit are small but rigidly constructed air capacitors with screw adjustment (no ceramic or mica trimmers). The coil was glued to a ceramic former, fixed in a shielding can and air-tight soldered up, to prevent humidity affecting the coil or built-in capacitors. An NPO feedthrough capacitor of 27 pF. is soldered into the can wall. 2 to 3 pF. capacitors connect the tuned circuit to the 12AT7 v.f.o. valve operating in the Franklin circuit, which seems to be the best choice.

Parallel to the tuned circuit are two series connected combinations of a 15 pF. air dielectric trimmer each and a P100 (TCc) and N3300 (TCc) ceramic capacitor of 50 pF. each. In this way one can bring more N-TCc and less P-TCc capacity in the circuit without changing the total circuit capacity value. This method is very much more convenient than the soldering of different TCc capacitors in the circuit, waiting one hour to cool down the adjacent components, running the set for a warm up period, and finding out that the temperature compensation is still not right after two more hours. The warming up time stability and also the long term stability of this v.f.o. is about ten times better than the drift of the v.f.o. in my BC221, which has a separate power supply similarly stabilised. The relay switching is extremely accurate and does not cause frequency jumps as many switches do.

A buffer stage with a 6AK5 valve follows the v.f.o., which has a broad band plate circuit with a low impedance output tap, from which the v.f.o. voltage is fed to the receiver second oscillator and transmitter first oscillator. The relays obtain 7v. and 100 mA. d.c. from the 6.3 filament voltage via a Si-diode and a 300 μF. charging capacitor.

The second chassis contains the i.f. amplifier and associated stages. It is advisable to use a fair amount of selectivity in the early stages to guard against far off resonance signals and reduce cross modulation and spurious signals. Therefore, four tuned circuits operating on the first i.f. are used with one low gain valve in between. The other reason is that the low frequency end of the v.f.o. range falls in the high



Top left: The receiver with the three chassis on top of each other, the two dials in the lower r.f. chassis and the speaker in the a.f. chassis. The knobs for the band switches are at either side of the lower chassis. This method gave the best layout with regard to r.f. requirements and the least mechanical difficulties. The dials are also home made. The sub-division of the receiver on three chassis reduces the table space requirements and modifications are easier incorporated or whole chassis can be replaced.

Bottom left: The i.f. chassis has on the left side the 1st i.f. stage with the tuning capacitor. The centre portion contains the many home-made shielding cans for the crystal filter i.f. tuned circuits. The S meter turns over 270 degrees.

Top right: R.f. chassis containing in the front section the Goerler turret and the crystal oscillator switch with the ferrite coils, fixed NPO ceramic capacitors and the crystals mounted around the switch. Octal valve holder contact springs are directly soldered to the switch which holds the crystals. The v.f.o. coil box is in the middle, and behind these are the relays (the covering shield was removed to take the picture). The two four-gang air capacitors are in the rear lower quarter. They are completed shielded and the stators are machined from silumin blocks. The rotors are shrunk on to a ceramic axle, which is held in spring loaded ball bearings.

Bottom right: R.f. chassis as seen from beneath. This shows the clear layout of the r.f. section with all valves in line as shown in the circuit diagram. Behind the valves are small shielded compartments to accommodate the small components like resistors and by-pass capacitors.

frequency part of the first i.f. band, which called for sufficient selectivity to prevent overloading of the i.f. amplifier. No trouble was experienced because the v.f.o. runs 352 kc. below the corresponding first i.f. tuning frequency. This set of circumstances could have been avoided altogether if a different set of oscillator crystals had been available. Three sets had been worked out which had no low order harmonics and frequency combinations falling in r.f., 1st i.f., or 2nd i.f. frequencies, a requirement to prevent beat notes and spurious responses. During a stage of the receiver development a mixer-v.f.o. with only one crystal and other attractive features had been used, but the undesired beat notes "did beat me too" and I gave up.

The coils of the 2nd i.f. tuned circuits are identical, but the fixed parallel capacitors are different in all four cases to compensate valve and circuit capacity differences. A four gang capacitor tunes the 1st i.f. circuits. Inductive stray coupling and slight capacitive coupling result in enough bandwidth so that this 1st i.f. capacitor needs only re-adjusting in 100 kc. steps. The same is true for the aerial trimmer. All i.f. stages are connected to the manual gain control as well as to the a.m. or s.s.b. a.g.c., which may be switched off. The second mixer uses a 6L7 valve —any type will do here—whilst the first mixer tube had to be a low noise t.v. type.

The existing unmodified 2nd i.f. amplifier has been described before in "A.R." The Telefunken type double crystal filter with two crystals and variable bandwidth is employed. The sketch shows the tap positions in % inductance on the pot core i.f. coils. The i.f. crystal filter is basically very similar to the well known HRO circuit, both using a bridge circuit, phasing capacitor and detuning of the i.f. circuit to vary the bandwidth. Differences are in the following refinements: The xtal is connected to taps of the adjacent i.f. coils to obtain the all important (often overlooked) matching. The correct tap position depends on the crystal Q, the operating frequency, and the Q of the tuned circuit as well as its L/C ratio. If the crystal taps are too close to the hot coil end, the bandwidth will be too narrow and a deep notch will occur between sharp peaks. If the crystals are placed too far down from the hot end, the selectivity will be far too low and the crystals lose their value. The maximum bandwidth required is also to be considered in this respect.

The phasing trimmers of 80 pF. are adjusted and fixed. The first trimmer is set in such a way that the pole (notch) of the response curve is placed 1-1.5 kc. below the lower corner of the flat top i.f. response at maximum bandwidth (3 kc. at —6 db.), whilst the second trimmer is similarly set but above the upper corner frequency of the flat top response band. How deep the notches are (—80 to —100 db.) and how little signal shows up outside the crystal filter response as side lobes, depends mainly on the degree of shielding of all i.f. leads and components to prevent coupling around the crystal filter. V.h.f. or signal generator design methods are called for here. With the other i.f. tuned circuits the side lobes can be kept well below —60 db. and the flat top range can be made quite flat.

On either side of the two crystals are 7-14 pF. air dielectric variable capacitor segments of a four-gang capacitor with insulated rotor and stator, completely shielded. In both cases one segment tunes the i.f. circuit to a higher i.f. and the other segment to a lower i.f. This continuous detuning results in a symmetrical and narrower i.f. passband without affecting the gain. With a bandwidth of 5.7 kc. —80 db. down and 3 kc. to 3.3 kc. at —6 db., this set-up is as good as a set of mechanical filters. This circuit has been used in i.f. amplifiers ranging from 130 to 1,800 kc. The b.f.o. can be used as signal generator and the a.g.c. as v.t.v.m. to align the i.f. circuits.

For a.m. demodulation and a.m. a.g.c. the twin diodes of the 6H6 are being used in the usual fashion. The cathode of the a.g.c. diode has a 1.5v. positive bias, so that weak signals do not operate a.g.c. system. The signal diode is connected to a noise limiter "borrowed" from an early Collins receiver.

A third mixer—also called product detector—is used for s.s.b. and c.w. reception. The 6AJ8 valve has a heptode as mixer and a.f. amplifier and a triode operating as b.f.o. valve. The difference frequency of b.f.o. and 2nd i.f. passes through the RC filter connected to the plate of the heptode. Several volts of a.f. signal are so obtained. The load resistor of 200K ohms and 20K ohms acts as a voltage divider for the a.f. voltage. The whole voltage is brought through a separating resistor of 100K ohms to a Ge-diode to obtain an a.g.c. voltage several times stronger than the i.f. signal to achieve an effective s.s.b.-c.w. a.g.c. action and to ensure that the i.f. signal at the product detector is well below the b.f.o. voltage. Both requirements have to be met to obtain low distortion and good s.s.b.-c.w. action, and this circuit is a simple way of achieving both. With the b.f.o. switch S4a the segment S4b adds a 1 μF. capacitor to the a.g.c. line to achieve the slower decay of the a.g.c. voltage needed for s.s.b.-c.w. reception, and this allows the use of the S meter. The S meter instrument has a rectifier built in, which helps to obtain the desired logarithmic sensitvity.

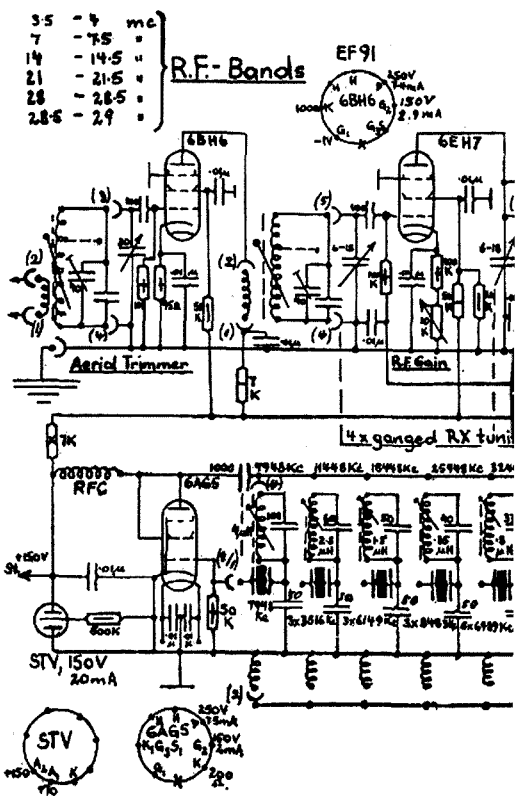
The top chassis contains the two-stage audio amplifier of conventional design. The final valve can be switched off with switch S6a and S6b if the headphones are connected to the a.f. preamplifier stage.

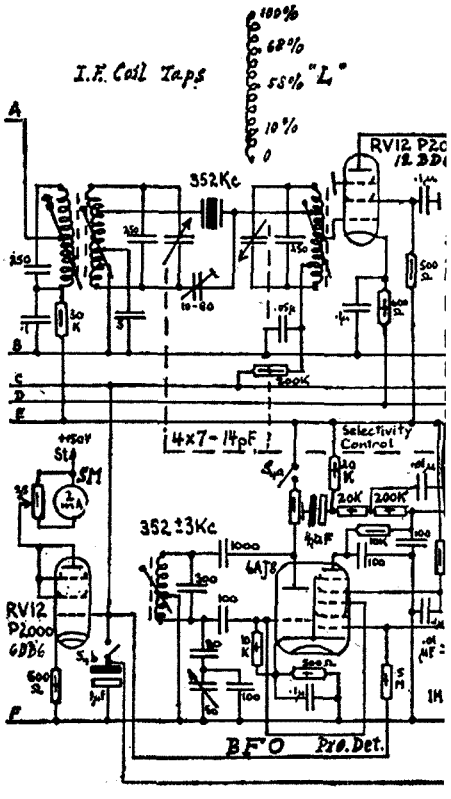
The power supply now uses silicon diodes which reduce greatly the heat formerly developed by the big rectifier valve. A 150v. 20 mA. voltage stabiliser is included and placed near the 1st oscillator. The v.f.o. plate voltage is also connected to this stabiliser.

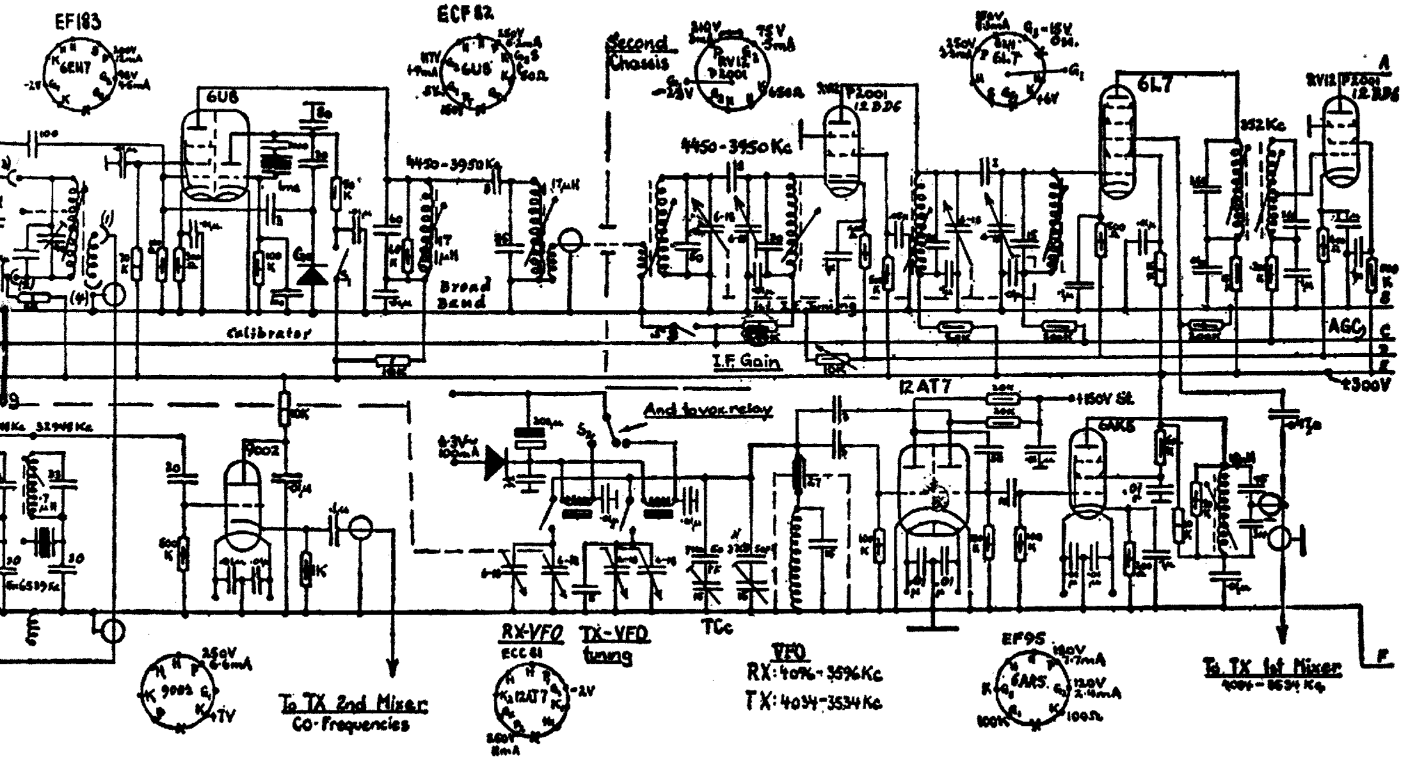
OTHER POINTS

The slugs of the plate circuits of the c.o. are of Q2 ferrite, which is good up to 50 Mc., and this core material has a high permeability, giving a wide L adjustment range. The c.o's. were first checked with an absorption type fre-

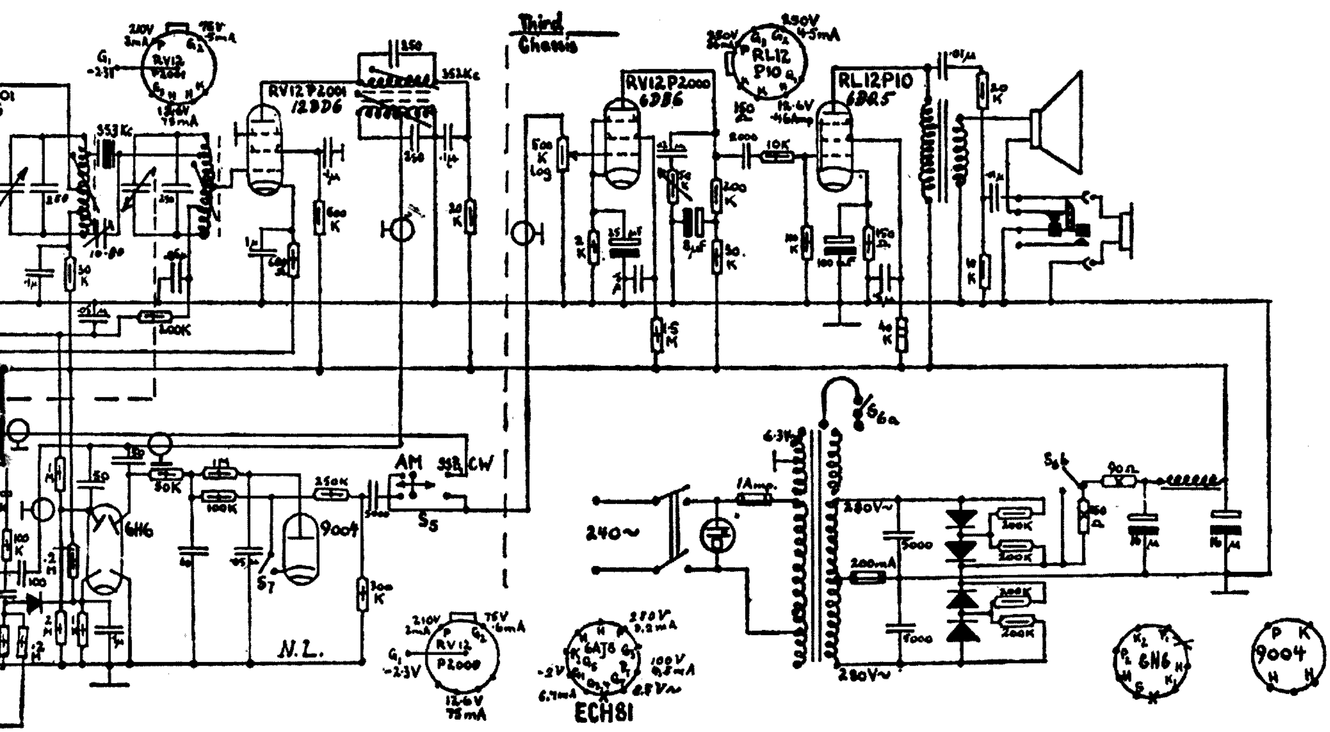
(Continued on Page 15)







EF183
ECF82
6U8
Second Chassis
RV12 P2001
12BD6
6L7
4450-3950 Kc
Broad Band
Calibrator
I.F. Gain
AGC
+300V
12AT7
+150V St.
6AK5
And to vox relay
9002
To TX 2nd Mixer
Co-Frequencies
RX-VFO
TX-VFO tuning
ECC81
12AT7
TCc
VFO
RX: 4096-3596 Kc
TX: 4034-3534 Kc
EF95
To TX 1st Mixer



Third Chassis
RV12 P2001
12BD6
RV12 P2000
RL12 P10
500 K Log
6H6
9004
AM
CW
S5
S7
N.L.
240~
1 Amp.
280V~
200mA
ECH81

YOUR PYE REPORTER, PTCA-116, Mk. II.

PART TWO—THE TRANSMITTER

DAVID PRIESTLEY, WIA-L3163*

As a follow up to last month, here is the procedure to line up your Pye Reporter Mk. II. transmitter.

Before I commence, may I give thanks to "The Master", Jack Kelleher, VK3AIJ, for the help he gave as far as his time was concerned.

Pertinent details for transmitter line up are as follows:—

Signal frequency: 53.032 Mc.
Crystal frequency: 5892.4 Kc.

Coil numbers are taken from the circuit of the PTCA-116 Mk. II.:—

L6—2 turns (this is the link).
L7—17 turns 16 g. enamelled wire (one turn spaced).
L9—5 turns 18 g. tinned copper wire (one turn spaced).
L12—5 turns 18 g. tinned copper wire (one turn spaced).
L13—17 turns 24 g. enamelled copper wire.

Coils L9 and L12 should be dipped for resonance at 53 Mc. The Philips trimmers on L9 and L12 will do this adequately.

Tank coil L7 is 11/16" in diameter. The condenser C56, which is in series with L7, will need to be slightly higher in value, preferably about 75 pF. These are readily obtained through trade houses.

Coil L13 must be dipped to 17.6772 Mc., this being the third harmonic of the transmitter crystal. Great care should be taken here to ensure that the second harmonic is not tapped, because this will cause a signal to come out in the middle of the Channel 0 spectrum of 45-52 Mc. The "doughnut" channel enthusiasts don't appreciate hearing CQs whilst they view the test programmes. However, a quick check with a good receiver whilst the crystal oscillator only is working will soon tell.

Now apply high tension to the buffer 6AQ5 and the power amplifier QV04/7 and feed into a dummy load. Tune the tank circuit for a glow in the dummy load and then peak trimmers C57 and C64 to increase the driver output and grid input circuits.

Now adjust the slug in L13 and watch the brilliance of the dummy load. It will increase to a point and then decrease. The brightest point is, of course, where to leave the slug.

However, at this point, don't get wildly enthusiastic and start calling CQ. You'll get as far as if you stood at the door of your shack and screamed your silly head off.

The modulator in these sets is exceptionally good and over-modulation is not hard to obtain. The only difficulty is that the double button microphone is more than likely to be worn out. For the price of a single button insert and about ten minutes work, the modulation returns to near perfection.

To replace the double button microphone, it will be noted that the middle wire in the mike itself goes to earth, and is also the earth return for the press-to-talk button. Remove this wire from the centre of the insert and connect it direct to the press button. The other two microphone wires now go to the respective take-off points on the single button insert. A further piece of work is to put a jumper wire across the electrolytic condenser C74.

Now, fire her up and equip yourself with a pair of headphones. Using an isolating condenser, to stop the h.t. reaching the phones, tap into the h.t. tank circuit feed point (at the r.f. choke), and put the other end of the phones to ground. Press the button and you should hear every little noise in the room loud and clear. Don't be disheartened with downward modulation, nearly all of those using these sets have it.

The output can be improved by adjusting the link to give maximum brilliance in the dummy circuit.

To make sure that nothing comes adrift, borrow the XYL's nail lacquer and dob it liberally on to anything that looks like it will move with constant vibration.

Now we can hook our newly modified set to the aerial and try for a call. Using the test jack on the side of the case, insert your multimeter probes into pins 5 and 7 and read off the p.a. plate current. Tune C56 for a dip and you will be ready for all those suitably equipped to hear you.

It may be necessary to replace the metal rectifiers in the power supply with silicon diodes. The metal rectifiers are worn out but be sure the diodes are of a 1 amp. variety.

Finally, the frequency of the crystal may be slightly off the net frequency of 53.032 Mc. Put a Philips trimmer across the crystal and the slight amount of pull necessary should be fairly readily obtained. ●

* C/o. R.A.A.F. Base, Werribee, Vic.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK5MS	24	306	VK2JZ	61	213
VK5AB	45	301	VK6KW	4	211
VK6RU	2	300	VK3WL	14	211
VK6MK	43	293	VK3ATN	26	204
VK3AHO	51	285	VK4HR	12	192
VK4FJ	31	278	VK4RW	23	186

C.W.

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK3KB	10	320	VK6RU	16	260
VK3CX	26	303	VK3AHQ	79	245
VK2QL	5	301	VK3ARX	66	242
VK4FJ	29	296	VK3XB	75	238
VK3NC	19	286	VK3YL	39	231
VK2AGH	71	262	VK2EO	2	230

OPEN

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK6RU	8	306	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	63	296	VK7LZ	23	242
VK6MK	74	295	VK4HR	7	233
VK3AHO	76	289	VK2VN	16	233

New Member:
VK3ACD 94 104

AMATEUR FREQUENCIES:
USE THEM OR LOSE THEM!

A Modern DX Receiver

(Continued from Page 12)

quency meter and synchronising of oscillation by the crystal was observed at frequencies which were as high as the ninth harmonic of the crystal. With the slug further screwed into the coil, the strength of the signal near the ninth harmonic became weaker, but the frequency was practically unchanged. Finally, output could be found near the 7th harmonic and the signal near the 9th harmonic disappeared. By screwing the slug deeper in, the same effect was observed near the 5th and 3rd harmonic, but the signal gained in strength as was to be expected.

Switch S2 operates the v.f.o. relay for receiver or transmitter operation. The switch has a neutral position and vox operation can then take over by connecting the vox relay parallel to the contacts of this switch.

The b.f.o. tuning capacitor covers a range of plus or minus 4 kc. and the plus or minus calibration from the centre position can be used to determine the correct carrier frequency of s.s.b. or c.w. stations, because they are tuned to corner frequencies of the flat top i.f. passband. Resetting the b.f.o. is all that is required to change from one sideband to the other, and this is usually combined with the band change. The use of c.o. frequencies for the first oscillator, which are for some bands on the other side of the r.f. band, would have caused complications, because then on some bands the 2nd i.f. tuning and v.f.o. tuning would run in the opposite way than on the other bands. When planning this type of equipment construction it is advisable to work out all frequencies of the r.f., c.o., 1st i.f. and 2nd i.f. for both band ends.

The numbers in brackets are contact numbers on the turret and c.o. range switch.

It is intended to build the transmitter in a similar manner on three chassis of the same size.

How good is the receiver? An Amateur friend, a ship's wireless operator, who visited many U.S. Amateurs and operated their gear, said, "This receiver handles c.w. and s.s.b. better with more stability and ease of adjustment and receiver flexibility than many very expensive commercial U.S. receivers." The ease of incorporating modifications and not having to worry about re-sale value are further bonus points. ●

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

The response I have had from members concerning our page is not great. One finds that it is left to a certain few, surely these days there must be enough active listeners around to keep me supplied with information to fill our page, which over the months has diminished in size. All that is required is a note on your doings, brief, and to the point, maybe a comment or a suggestion. It's as easy as that, so what about it chaps?

ANTENNAE

Due to the fact that any length of free wire in space acts as an efficient radiator or interceptor of radio frequency energy at one fundamental frequency, and the harmonics of that frequency, it is a difficult problem to make an antenna work over a wide range of frequencies. All types of all-wave antenna systems for best results use a matching transformer between the lead in and receiver. In many instances, reception can be improved by the addition of an antenna coupler between the feedline and the receiver, and in all cases the r.f. image rejection will be increased.

Normally the coupler will be adjusted for optimum coupling, or maximum image rejection. By detuning the coupler, it can be used as an auxiliary gain control to reduce the overloading effect of strong local signals.

A simple antenna coupler circuit will be found in the "Radio Amateur's Handbook." Easy to construct and will fit into a box 5 x 4 x 3 inches. If you require information on the coupler, it will only cost you a stamped addressed envelope.

A type of antenna giving good results and using no matching tx is the General Electric Vee Doublet. This is one of the best all-wave antenna systems and requires a span of 50 ft. The Hawkins triple vee doublet is essentially similar, the only advantage of the triple vee is that it requires only a span of 40 ft. instead of the 50 ft. required by the G.E. system. Assuming lowest resonance for both types at 6.1 Mc., the use of the triple vee is sometimes desirable when there is not enough available space for conventional doublet or a half-wave antenna. The triple vee requires about one-sixth less length of span for a given frequency than a resonant half-wave single wire. For example, at 7 Mc. an ordinary half-wave aerial is about 67 ft. long. The triple vee resonant at the same frequency is only 54 ft. long. The triple vee is somewhat less directional than a single wire, its overall efficiency is about the same. It has a lower Q so it can be used over a wider band of frequencies than a single wire, and is a good aerial for a limited space. The spacings between the ends of each vee should be about 10 per cent. of the length of the antenna. A sketch of either the Triple Vee or the G.E. Vee Doublet may be obtained by sending a stamped addressed envelope. Remember for all aerials, "How high is the sky". Sid. L2258.

Our congratulations go to the following members for their respective wins in the 1963 VK-ZL-Oceania Contest: L2033, L3183, L8021 and BERS195.

NEW SOUTH WALES

Attendances at the monthly meetings have been fair, but this is only to be expected during the cold weather. It is pleasing to note that from time to time that our country members, who happen to be in Sydney, call in to the meeting. I feel sure that they are pleased with the assistance they receive as would many more if they were to come along.

Keith L2269 tells of the purchase of a t.v. set and being a new t.v. area, well, I guess until the novelty wears off shall not be doing any s.w.l'ing. Ross L2233-VK4 has logged on 14 Mc. W0, W5, W8, ZLs and VR2. When you are in Sydney later this year we hope to see you at No. 14. Ross L2290-2ZKB is busy derusting and undercoating a tower. Also preparing a rig to get on the air for his first CQ. He is also busy with c.w. as he hopes to sit for the full ticket in October. Our good wishes go to Ross. Don L2022 is troubled with local interference over a period, but on 7 Mc. c.w. has received HK, KL7, GI, VE and OA. When you are in our city during Sept., Don, don't forget to drop in at our meeting on the third Friday.

VICTORIA

Recently I had the pleasure of meeting Mac L3074 for the first time and if he is a sample of the s.w.l. down south, then they must be a mighty fine lot of chaps. In a very informative letter from Eric L3042, mention is made that there are quite a few active s.w.l's. in VK3, and being Inwards QSL Manager in that State, suggests that if QSLs are any indication a rival to his efforts will be Greg Earl, L3138. As at the end of May this year, Eric has sent out 600 reports, and received QSLs from 93 countries. Heard recently on 14 Mc. c.w. were LU8, W3FMC/MM, 7 Mc. c.w. SM7, VP9, HK4, VR2, YN7, YV1; 3.5 Mc. c.w. DU7, W8, JA3; 1.8 Mc. c.w. VK2s, 5 and 7. With Eric's many interests, I really don't know when he gets time to listen.

Greg L3138, the busy boy from Black Rock, has received QSLs from ZB1CR, UB5WI, HI-8XAA, UO5PK, G6TA, OH2KZ and DL3RK. Hence the few rungs up the DX ladder. Congrats on your appointment to QSL Manager for the Moorabbin Radio Club. For those who are not aware of the fact, this club is the largest of its kind in Australia.

Colin L3188 is an addict to the v.h.f. bands and listens mainly on 2 mx. Try and get that 52 Mc. converter ready for next season as I feel sure that you will enjoy that band very much.

Maurie L3055, owing to studies, has not done any s.w.l'ing for the past three months. He has now caught up with his work and hopes to spend a few hours each week-end at DXing. So maybe next month we shall hear a little of his doings.

Noel L3I01: Congrats on your two Popular Electronics awards OM. Could you let me know the score on these awards so as I can impart it to the members who may be interested? On 14 Mc. Noel has heard ZS6, W6, KL7, W0, VP5, JA5, I1BKK and uses an 8JK 20 metre antenna.

QUEENSLAND

Graham L4091: Thanks a lot for the circuits OM. We shall use them at a later date. Graham uses a Hallicrafters rx and is erecting a new antenna at the moment. Lately has heard VEs and South Americans.

Michael L4088: Michael is a member of the local radio club and intends sitting for his ticket early next year. We wish you all the best.

SOUTH AUSTRALIA

Alan L5065: With all that local interference your tally of 117 countries is a pretty good effort. Congrats on your win in the S.W.L.C., very good. I hope the new three element beam is a success. Alan heard recently JT1, XE1, KL7, YS1, G4, FB8, YV5, ZS1, ZS3, KC4, EA3 and UM8.

WESTERN AUSTRALIA

Peter L6021: A glance at the DX ladder will show that this lad is going to give the leaders a challenge. If the wide variety of QSLs and stations received continue, he must eventually reach the top. Peter's present rx is a B28, 12 tubes, his antennae are a half-wave dipole on 20, a half-wave dipole on 40, and the same for 15. For 80 he uses a wire 180 ft. DX heard recently: 7 Mc. c.w., VE3, KV4, CR6, DM3, KZ5, HI3, UP2, MP4, SP6, ON4, G3, DU1 and XE1.

TASMANIA

Mike L7077 (7ZAV), the bug bear of Burnie. Mike has migrated to the north of the Apple Isle, which brings him a bit closer to Australia hi. He intends going off the deep end later this year, and believe it or not his XYL to be is 7ZYL. We wish you all the best in your new venture OM.

I would like to thank those members who took the time to pen me letters, also those for the good wishes re the page, and my recent operation. I trust those who requested, and received copies of the b.f.o. and time chart found them to their liking. Be with you next month chaps. 73, Chas. L2211.

S.W.L. DX LADDER

	Countries		Zns.	S.s.b.		W
	Conf.	Hrd.	Conf.	Conf.	Hrd.	Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	124	275	38	20	104	35
P. Drew	112	240	31	55	203	29
A. Westcott	93	159	31	9	107	11
M. Hilliard	87	241	33	34	169	12
M. Cox	84	232	30	51	163	21
G. Earl	63	150	28	43	133	7
C. Aberneathy	60	102	32	—	—	14
N. Harrison	54	169	30	19	60	37
I. Thomas	42	139	20	16	97	14
R. Beckley	27	47	19	—	—	—
A. Raftery	14	117	15	—	—	—
R. Oats	9	26	8	—	—	—

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

S.W.Ls. AND QSLs

Editor "A.R.," Dear Sir,

I have read and studied the letter from VK8KK (June "A.R.") in which he speaks his mind in respect of s.w.l. reports, QSLs and postage!

As an experienced s.w.l., a W.I.A. Inwards QSL Manager, and a QSL Manager for two rare DX stations, I must fully endorse the feelings expressed by our VK8 friend. At the same time I appeal to my fellow s.w.l's.—both at home and overseas—to "stop and think" before submitting your reports.

You should ask yourself "will this report be worthwhile, either for the recipient or for me?" If the answer is "yes," go to great pains to point out the special reason why you submit the report. The person at the other end will then be in the position to understand more fully why the report has been submitted (and why you need his QSL!).

I do ask all s.w.l's. wherever you might be to include with your reports some details of what you heard transmitted by the operator concerned. For too long, far too many s.w.l's. have been contented to include bare log details only—overall this is not good enough in the minds of most transmitting men. You must prove that you really did log the signals you are claiming to have heard and the surest way of doing this is to include some "copy" of what the transmitting man (or woman!) transmitted.

—Eric Trebilcock, L3042/BERS195.

COIL FORMERS

Editor "A.R.," Dear Sir,

Reference Harry Major's (WIA-L3102) letter in the March 1964 issue. I agree with him in most of his points raised, as a matter of fact I recently wrote to the R.S.G.B. to ask for, and I obtained, their permission to republish the last two pages of their excellent Handbook as they give all the info. necessary to wind coils on formers which are easily obtainable (as a passing remark, Id. each from a national advertiser).

Whilst discussing formers, "pill" containers from the chemist in plastic form make excellent formers, and can, if required, be cemented to a valve base for plug-in type or the cap can be secured to the chassis by nut and bolt to push the coil on, and it is easily removable for adjustment or putting another coil in.

Whilst writing to the R.S.G.B. I pointed out the difficulties of Amateurs in other countries in obtaining commercially quoted coils in articles in their publications and the Editor tells me that they now endeavour to get all contributors to give the details of coils used for the benefit of outside U.K. constructors. "A.R." contributors might also take note of this latter remark.

This letter, I hope, will serve as the first lever to get the Editor to consider republishing with due acknowledgments the two pages concerned.

—A. F. W. Haddrell, VK3ZFC.

INFORMATION REQUIRED

C/o. P.O. Sunbury,
Victoria.

Editor "A.R.," Dear Sir,

For some time this Association has conducted a DX programme over stations 3SR and 3UL. This programme has been aimed primarily at providing up-to-date news for the experienced short-wave listener and information of easy-to-log stations for the s.w.l. beginning in the hobby.

It has been decided to include in the programme a regular monthly service feature directed towards the Amateur operator and the s.w.l. interested in the Amateur bands.

It would be appreciated if you could undertake to supply, or put us in touch with, someone who could supply regular monthly information of interest to Amateurs, such as band conditions, call areas being heard on various bands (including 2 and 6 metres), forthcoming Contests, etc., etc.

It is anticipated that this feature will be aired during the first week-end in each month, and your co-operation in making it possible would be greatly appreciated.

—Roy Frost, VK Rep., N.Z. DX R.A. (Inc.)

D X

VP4, OA4, BV, ZM7, 7G1, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

There is very little change to report in the state of the bands this month. Very little activity during the hours of darkness, generally the usual contacts can be had but the real DX stations and rare ones are extremely hard to come by. It's a case of listen, listen. listen if you want to be the one that gets the contacts. Generally the conditions prevailing suit the idle rich or the poor shift worker, hi.

80 Metres: An occasional break through if you are lucky enough to be on hand when it pops. Generally speaking the noise and instability of this band leaves a lot to be desired, i.e. DX-wise.

40 Metres: No change here from last month. G contacts around 0830z are definitely slipping. An occasional South American contact can be had on s.s.b. and the usual run of QRN, Commercial and QRM gets a little bit hard to take. Islands to the north after dark can be heard most nights, but contacts are not very enjoyable under such stress. Activity even towards W has lessened this month.

20 Metres: Very little this month during the morning hours and changes daily, still W and Central America around 0330z onwards, with the skip shifting gradually north through VE to KL7, thence to UA, etc. The only change here is the working of many more stations from the continent of Africa. There are not many on owing to the time factor, but those that are on are of good workable strength. It is no trouble to have a three-continent hook-up with VE, ZS and VK at the one time—0730z. Favourable openings on the long path to Europe can be had at 2300z on some days.

15 Metres: Unchanged from last month. Habits remain same.

10 Metres: Nothing to report.

COUNTRIES AND AREAS WORKED

Self on 14 Mc. s.s.b.: XE2LV, XE1PUN, TG-9RS, VE5FN, VE6SF, VE8RX, UA0KIF, W4-5-6, ZS2RM, ZS6AOW, ZE1JE, JA1AHX, VR4EG, K7WKW, etc.

Ken VK3TL reports that short path to Europe has just about closed even if you wait up till the late evening. However, long path in the mornings is coming good to Europe. On 15 metres there have been several openings to the States during the daylight hours. Ken has worked on 14 Mc. s.s.b.: VP6KL, 6Y5MJ, ZS2RM, GM2FHH, WA4JXV/VO2; 14 Mc. c.w.: 5R8AI, FB8WW (Crozet), WA4JXV/VO2; 21 Mc. c.w.: WN4PLY, WN4PXP. Best QSLs: OX3JV, VP7CC, VE8RN (Zone 2), VP8GQ (Sth. Orkneys), VQ1GDW, YA1AN, 5Z4AO, 9K2AN, 9A1AIJ, 9A1CWN, SL2AD. Tnx Ken.

Garry VK5ZK reports a quiet month, but has worked the following: 14 Mc. s.s.b. FG7XV (0515), TI2JIC, HC8FN, UA3CR, UA3FU, XE-1AZ, XE1MO, JA0RM, G3ENZ, TG9RJ and many Ws. 21 Mc. a.m.: W3-4-5-8-7-8-9-0, but band poor in VK5. Tnx Garry.

Peter Drew, L6021, from VK6, reports hearing the following on 7 Mc. c.w.: VR1B, G3PFZ, VS1FZ, ON4JB, DU1TA, VE3BLU, F9NF, KH-6EWA, JA1CSX, JA2DCN, 9M2DW, SP6ALD, DJ1FC, CT1DJ, SP6AEG, UP2KDA, CR6JL, DM3RM, CR6AI, ZS5WP, I1RIF, UA9RO, KV-4CI, VE3EPR, XE1FFF, UT5HT, DM3VMJ, VS1LJ, OR4VN, FB8YY, YU3BNZ, PA0MPR, DJ5PA, SP8CP, VP6KL, G3KSH, EL2AD, HA-1KSA, EL0B/MM, SP6AWB, UT5BP, YO6FR, VQ2DT, OH1AD/0, YV5BDK, LA5HE, VS1LU, DJ7AU, LZ1SP, OK1FE, LZ1DZ, UA9VB, DL-7AA, UB5KBR, SP3ART, YO3SC/MM, UA1DS, YV5BMY, UB5FK, 9M2LO, G3OLS, SM4CAN, SM7TT, SM7DGA, OK3KBM, SP3KET, UA3-KAB, UB5ZB. 14 Mc. c.w.: JA7NI, ZS5QU, KL7DPF, FR7ZD, FB8WW, VU2LN, KR6HJ, UJ8AH, VQ8AM, VS1JW, 9M2YY, BY1PK, VQ2IE, DU8TY. 14 Mc. s.s.b.: KC6AA, ZS2RM, ZS6CR, KL7PI, KL7BJW, JA3AJF, ZS4U, ZS-6ANE, YV1II, UL7FA, HK5EV, VP9EV, OZ5ZU, VE3XK, 4U1ITU, OH2NB, HK3AFB, TI2CMF, HS1BD, HI8CLU, VS9MG, KG6NAA, VE7AIE, ZS6OS, VE6RJ, W0PI/KM6, VQ8BFC, ZS3HT, CR7GF, VE7ZM, DU7SV, ZS1JA, WB8BZS/KJ6, CR9AH, JT1CA, VU2NR, ZS5KI, XE2VY, ZS-8NE, ZS6AJ, VE7PV, KC6BO, HM5BF, VQ2JC, VQ2RB, ZD6PBD, 9Q5AB. Tnx Peter.

VS9MG, Maldaive Islands, can be heard on approximately 14120 kc. on most Saturday mornings 0130z with s.s.b. signals, sometimes works with VS9MB who runs very low power, also on s.s.b.

Olaf KL7QDQ reported transferred to the Aleutian Islands.

Stan KC8BC on the island of Panape, East Carolines, can be heard calling CQ around 0930z on 14 Mc. s.s.b. if you need this one.

VR4EE and XYL VR4CM are using a Swan from their QTH in the Solomons, which at the moment is powered by batteries.

John VK8JI reports that activity in VK8 very quiet with DX very inconsistent at Darwin. He will also be in VK3 permanently as from September and hopes to be on s.s.b. soon after that date.

VK9CS heard working W with good signal during the afternoons.

CR7GM can be heard calling CQ on s.s.b. approx. 14110 kc 0600z, but if no answer he then looks for the missing States for completion of his W.A.S.

A certain VE station complained bitterly to me about the commercial and associated QRM on 14147 kc., said that far too many were occupying our bands so he shunned the frequency for four days. QRM on the fourth day got the better of him so he decided to investigate and found to his horror it was FB8WW and the pile-up.

JA1ACX and friend on 7.1 nightly on s.s.b., but apparently cannot converse in English, both have good signals.

W stations are copiable here all through the daylight hours, but are only workable for about 4-5 hours daily because of QRM on 14 Mc.

News is requested by lots of DX stations re the hours of operation of Chatham and Campbell Islands. Anyone help?

If you are listening intently on 14 Mc. and hear a series of clicks and tinkles, rumour has it that it comes from some scanning device in Antarctica.

Group of DU stations on a.m. 7045 kc. headed by DU1RS can be heard chatting away nightly and includes DU1, DU6, DU9.

Colin VR4CB and charming XYL Bessie should by now have arrived in VK. They will be visiting most States. They are due at this QTH on 25th July. Welcome from all VK friends. For those interested, Anzac, the pooch, will be left in Gaudalcanal to carry on his life of vice.

VK6GU heard working VK0GS on 7080 kc. around 0900z.

Reported that an OA4 bobbed up on 3.5 Mc. a few nights on s.s.b., but not heard here unfortunately.

Steve ex-VK0VK would like anyone who hears any DX querying the non arrival of his card to pass on the information that he has now settled down and attending to the despatch of as many cards as soon as possible.

ZS2MI on s.s.b. around 0830z, approximately 14103 kc. Signal not always strong, but quite workable.

K7WKW, Salt Lake City, Utah, is a ready starter for QSL from this State. Anyone who needs Utah will find him on approx. 14280 kc. most days.

YA4A is the call sign for Dick K4UTE, who expects to operate for at least ten months from Afganistan.—VK5RX.

WN4QKP, of Miami, who operates mostly on c.w., is the son of W4EMB. He is 7.

JT1KAA, of Ulan Bator, in Mongolia, is on s.s.b. You will find him on 14103 kc. Mondays, Thursdays and Sundays from 0000z.

ZD9AM is transferring to Marion Island for a period of 12 months. S.s.b. with Collins equipment.

OH0NC at Aland Islands is reported active at 0130z, frequency is 14285 kc.

VS9OC. of Oman, reported active on 7010 kc.

ZS9A is active from Bechuanaland with a 50-watt rig. He hopes to stay one year.

QTH CORNER

Note.—Name of country must follow these addresses:—

CE2BD—Oscar Araya, Independencia 581, Ovalle.
CN8CQ—Andre Haubert, 41 Rue de la, Republique, Rabat.
JA1ACW—H. Oshio, 496 Yokohiba, Sanbu, Chiba.
LU1RA—Eduardo E. Idigorus, Oconuija, Catamarca.
YV5AWP—Dagaberto A. Romer, Jnr., P.O. Box 406, Caracas, Ven.
ZB2U—W. Hooper, 2 Lighthouse Qrtrs., Europa Point, Gib.
ZS2AR—H. P. Bakkes, 24 Komanl St., Queenstown, C.P.
ZD1AW—Alf Wilson, Lungri Airport, Freetown.
4S7BR—B. D. Rampala, "C" Bungalow, C.G.R. Wrkshps., Ratmalana, Mt. Lavinia.
5A1TA—Charles S. Patterson, P.O. Box 385, Tripoli.
4X4FM—Haim Lieberman, 49-7 Shekhunat Shimshom, Askelon.
3A2CX—Max Bouteleux, 49 Reu Grimaldi, Mon.
ZS7S—G. B. Stones, Schoch St., Mbabane S.
SM3CYR—Alf Regnander, Prestgatan 4-b, Ostersund.
G13CM—J. Patton, 11 Barmont Crescent, Belfast 4.
PJ2CA—Sybren Reitsma, Dam 2, Juliana Dorp., Curacao.
VE8RG—Thomas Rait, C/o. Fed. El. Corp., P.O. Box 2330, Edmonton, Alb.
G2ARP—R. Spivey, 53 Maybury, Maybury Rd., Hull, Yorks.
F2DS—Serge Siebert, 22 Rue de Philippeville, Reims, Marne.
CR5AC—Anibal Do q.b., Vincente, Bissau.
CX4JY—Mauricio S. Ribas, Amorin 1142, Salto, Salto.
CE1FW—Ismael Nunez, Casilla 192, Copiaco, C.
9G1YL—Ruth Kaiser, P.O. Box 1981, Kumasi, G.

SIGNALS ON 20 METRES

If you work exclusively on this band and continually work DX, it might be a good idea for some to get a local check on their signals sometimes. These remarks are advice in a friendly way, that some signals are not what the operator thinks he is transmitting, especially s.s.b. The writer fell into this unhappy situation once, always with the same stations, and we became very good friends with skeds in almost every State of U.S.A. Eventually came a report, followed by another, then one said it's been going off for weeks. Finish up, I wrecked the tx. Let's take time off and get that check every three or four days at least. The DX will still be there afterwards.

In this edition thanks to Peter Drew, George VK5RX, Garry VK5ZK, last but not least, Ken VK3TL. 73, Bert VK5BB.

☆

MEET DL3ZI

MANFRED STAAR
42 Oberhausen, Flockenfeld 82, Germany

Fred, owner and operator of DL3ZI, is aged 34. He has one boy aged six years, one daughter aged six months. His favourite pasttime is learning electronics. He is employed as a fireman in the fireguard at Oberhausen, the coal centre of Germany.

His first QSO was in 1950. He uses an AR88 receiver and the transmitter is a Geloso v.f.o., frequency doubler, 814 in the final and runs 150 watts input. His electronic key is home-made. For local contacts he uses a screen grid modulator. A mosley TA33 squirts the r.f. in the required direction from only roof high.

Fred has 280 countries worked and 275 confirmed. His certificates include W.A.E.1, W.A.A., W.A.S., D.L.D.500, D.X.C.C., etc. He is an avid stamp collector who also likes to collect various radio club badges. An Amateur with a good sense of humour, as you will see after you work him and receive his QSL card.—Bert VK5BB.

YOUTH RADIO CLUBS

This was a big month—three of my four readers wrote to me and 5PS spoke to me three times in his notes!

Keith 2AKX kindly sent me some further details of the Booragul personalities. The most interesting is Susan Brown 2BSB, first school-girl A.O.C.P. and first of the new VK2-B call signs. We have given some news of Susan a couple of months ago, but she is now on the air (only one hour a week until after Leaving Certificate!—usually Saturday), so if you contact VK2BSB, she receives c.w. at 18 w.p.m.

Another Booragul type is Jan Oosterveen, VK2BJO, now working with P.M.G. and working 80 mx. From the same area is Ross Beckley, VK2ZJB, not yet on the air but doing c.w. test soon for full licence.

Keith has a small class (at his new Westlakes Radio Club) on Saturdays, doing Y.R.C. certificates and a class of 14 on Wednesday nights doing A.O.C.P. Busy man! We could do with many more like you. I repeat a special question for the Newcastle boys (asked some time back) "How many Youth Radio Clubs in such a large centre?"

I have already congratulated VK5 Division for the appointment of Bob 5OD as Y.R.C. Supervisor. As I am fond of asking questions, I ask another one: "What steps are being taken by the Division organisation to help Bob?" News is eagerly awaited. It is pleasant to hear that Port Pirie Y.R.C. is even more active than ever.

Ken 3TL was regular as ever with his Newsletter containing some interesting news items. The Institute for the Blind at Burwood have not been forgotten. Ken himself went portable, John 3PZ had the boys work mobile from his car and Club Instructor Bruce Whitehead set up a temporary 80 mx antenna. . . . Eric Snibson, instructor of Caulfield Grammar Club, has managed some donated equipment from parents. A membership fee of 5/- per term has been fixed. What do club leaders think? Does anybody appreciate something they get for nothing? . . . Barbara Knight and Joy Byatt report that St. Anne's C.E.G.S. have had a few lectures from a R.A.A.F. officer stationed at Sale. . . . Michael Gurry, secretary of the Bundoora Radio Club, reports club activity in building amplifiers and small receivers. The club has the loan of a s.w. receiver and there is much logging of Amateurs. . . . The best news of all is from Robin Rowlands of the Scotch College Club. Two more of their members have qualified for Limited A.O.C.P. (What about some names and details, Robin?). Plans are being made for a 10-element yagi on the roof of the Physics Lab.

When I talk of help from a Division organisation, I don't necessarily mean that the Council go out into the field. They already put some of their valuable spare time into administration. But VK2 Council have recently done more than their share. Division President Vic 2VL, Y.R.S. Supervisor Rex 2YA, and Education Officer Harold 2AAH co-operated to instal equipment at Cronulla High School Science Exhibition and demonstrated mobile to base communication, to the great interest of all visitors. Division Vice-President Ivan 2AIM demonstrated an Amateur Radio tx to 30 members of Parramatta Congregational Men's Association and gave them a talk on the history of the Amateur Radio Service and its present day status. In fact, Harold invites organisations in VK2 to write to him and he will arrange talks and demonstrations. 73, 1KM.

VK2BSB, SUSAN BROWN

Fifth year at Booragul High—maths.-physics-chemistry type, but also Honours English—prefect, house captain—won Sulphide Corporation scholarship—allocates one hour per week to radio because exams. near for Leaving Certificate, 10 minutes for call-back to VK2AWX (Hunter Branch) and 50 for chats on Saturday—transmitter is 10w. with Eddystone receiver—member of Keith 2AKX's Westlakes Club at Teralba—has driving licence (age 17)—keen interest in mechanised things—receives c.w. at 18 w.p.m.—studied radio for 3½ years.

ELEMENTARY CERTIFICATES ISSUED

Shown above are members of the A.P.I. Radio Club, in conjunction with the W.I.A. Y.R.C. scheme, receiving the first Elementary Certificates issued in Victoria.

Left to right: Mr. George Munro (Divisional Engineer, P.M.G. Training School, Vic.), David James, Peter O'Neil, Tony Newman, Richard Philp, John Liversey, Fred Mackrewicy, John Newman and Club Instructor, David Buck (VK3ZMX).

Richard Philp has since passed L.A.O.C.P. and is now VK3ZRP.

Johannesburg Festival Award

This award is available to all Amateurs who have contacted the required number of Johannesburg stations during the festival period July-October, 1964. This award—considered to be the most attractive one produced for a long time—is descriptive in design and presented on the inside of a folded card. It tells the story of the phenomenal growth of Johannesburg in story and colour illustrations.

DX stations (except zone 38) must contact five Johannesburg stations. Zone 38 stations (except ZS6) must contact 10 Johannesburg stations. ZS6 stations must contact 20 Johannesburg stations.

Phone, s.s.b. a.m. or mixed contacts with a minimum report RS 33 or RST 338 will be allowed.

Send a certified list (No QSL cards) to the Awards Manager, P.O. Box 7227, Johannesburg, Republic of South Africa. There is no charge.

S.w.l's can also qualify and are required to send a certified list of the required number of stations heard as provided in the rules above.

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SOME TRANSISTORS CARRY 600% DUTY

CANBERRA.—Tariff duties on some imported transistors was as high as 600%, a member of the Tariff Board (Mr. R. Boyer) said recently.

Mr. Boyer, in a Tariff Board report, criticised the present method of imposing duties on them. But the Board decided by a majority decision to retain the present duties unchanged.

They provide for a duty of 2/6 British preferential and 3/9 most favoured nation rate, or 27½% and 45%, whichever returns the higher duty.

"Unreasonable"

In his dissenting opinion, Mr. Boyer said that in some cases these rates meant a duty of 3/9 was applied on a transistor valued at only 7d. He said this was unreasonable.

Mr. Boyer said that if efficient Australian producers in fact needed such protection against foreign suppliers, the local industry was clearly uneconomic.

The Board rejected an application by local manufacturers for an increase in duties.

—Brisbane "Courier Mail," 36/6/64.

VU2/4S7 DX CONTEST 1964

The Amateur Radio Society of India and the Radio Society of Ceylon invite Amateur Radio Stations in all parts of the world to participate in the first VU2/4S7 DX Contest. The object of this Contest is to enable DX stations to work as many VU2 and 4S7 stations as possible during the two week-ends.

The Contest periods are: Telephony—October 10-11; c.w.—October 17-18. The commencing time in each instance is 0600 G.M.T. Saturday, and the finishing time 0600 G.M.T. Sunday.

There are three main sections to the Contest: (a) Transmitting telephony, (b) Transmitting c.w., (c) S.w.l.—telephony and c.w.

All Amateur frequency bands may be used. The serial number will comprise RS or RST report plus three figures, which may begin with 001 for the first contact, and which will increase in value by one for each successive contact. If any contestant reaches 999, he will start again with 001.

Scoring: For DX stations—Two points for each contact on a specified band with VU2/4S7 stations and 1 point for each contact on a specific band with the rest of the world.

For this Contest, the A.R.R.L. Countries List will be used with the exception that each Call Area of W/K, JA, SM, UA, VK, ZL, etc., will count as "countries" for scoring purposes.

Legs, DX Stations: (a) Logs should contain date, time (G.M.T.), call signs of stations contacted, band, serial numbers sent, serial numbers received, and points. Different logs must be used for each band. (b) The summary sheet should show call sign, name (block letters), and address, details of equipment, total score by showing total points for all bands. Sign the declaration that rules and regulations were observed.

Logs and accompanying summary sheets should be sent to A.R.S.I. Contest Committee, Post Box 584, New Delhi-1, India, and should be postmarked not later than Nov. 15, 1964.

Awards: Certificates will be awarded to each country (call areas in VK) on the following basis: (a) top scorer using all bands, (b) top scorer using one band, (c) to those with minimum contact requirements, to be determined by conditions and activity prevailing.

There is an S.w.l. Section which is open to all members of any s.w.l. society in the world. The rules are the same as for the transmitting section. To count for points, logs will take the same form as for the transmitting section and should contain date, time (G.M.T.), call of station heard, serial number sent by the station heard, band and points claimed. Scoring is on the same basis as for transmitting and the summary sheet should be similarly set out. Certificates will be awarded in each DX scoring area.

DX stations may log only VU2/4S7 stations.

V H F

50 - 144 - 420 - 576 - 1296 Mc.

Sub Editor: LEN POYNTER, VK3ZGP.
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Winter and its effect on activity is painfully apparent here in VK this year. So far there has been no reports of 6 mx DX up to early July. Whether the level of activity has lost the usual enthusiasts or Channel 0 has covered up the band is not yet known. However, from all reports this t.v. signal is reaching out in all directions. From Perth to Wellington from Prosperine to who knows where.

Across the other side of the world comes reports of real space age DX. Moonbounce contacts between OH1NL in Finland and W6DNG on 144 Mc. After eight years of effort, a two-way contact was made in May of this year. Then further news, that KP4BPZ, with the help of a 1000 ft. dish, worked W1FZJ on 144 and 432 Mc. a.m. There are further reports of contacts to DL on 144 and G on 432. David VK3QV was in W land at this time but unfortunately was unable to be around at the right place at the right time. David had eyeball QSOs with quite a few v.h.f. personalities during his trip to W and G land. Spent some time with Sam W1FZJ, visited W1AW and A.R.R.L. Hdq. In the U.K. appeared on a.t.v. via G3NOX/T near Cambridge, the co-holder of the European 1296 record (150 miles to F3) and saw and heard the v.h.f. activity in both W and UK. Hope to have more news on these Moonbounce episodes for a later issue.

Here in VK, awaiting the Oscar project to go into orbit—wonder how far we will work in VK? 73, 3ZGP.

VICTORIA

The v.h.f. bands in VK3 have been very quiet of late. The only real activity on 6 metres being Channel 0. Ted 3UU and Doug 3ZJJ have just built gear and are ready to log a few contacts. Two metres has been fairly inactive. Trev 3ZIJ, ex Yarrawonga, has moved to Melbourne and Col 6ZCI has also.

The VK3 V.h.f. Group are planning a beacon on 2 metres. The proposed frequency is 145.00 Mc. Any VK Division having suggestions for or against the beacon or its frequency are asked to write to the VK3 V.h.f. Group Secretary, Peter 3APJ.

432 Mc. has been very active and there are now about 26 stations operating on this band.

Mt. Gambier V.h.f. Convention: Approx. 36 Hams from VK3, some with XYLs and harmonics, attended the Convention which was a big success, and is the first of many the VK5 S.E. V.h.f. Group hope to have. A very good time was had by all who attended. (See photograph on this page taken at Mt. Gambier.) 73, Cyril 3ZCK.

Seen at V.h.f. Convention at Mt. Gambier.

QUEENSLAND

50 Mc.: 4ZRC had a very fine week-end in Toowoomba recently. Using his flea-power mobile, he worked four of the Brisbane stations. John 4PU and John 4ZES, both of Woombye, have been working into Brisbane regularly during the past few weeks. George 4ZLG has finally put his new bird-perch up and even the kookaburras are airsick by the time they reach the 6 mx beam. Roy 4ZRM and Royce 4ZRH also have new towers.

It goes without saying that the boys with the towers have been working into Lismore—Harry 2AWH and Ted 2ZFS are regulars. Bill L4001 tells me that many of the Ipswich s.w.l's are building 6 mx converters and already QSL cards have been sent from Ipswich to the Brisbane boys.

A party from the Ipswich Amateur Radio Club visited George 4ZLG and Ray 4ZRM and it seems that Norm 4KO has bought a kit of parts for a 6 mx tx and Bob 4LI is also interested in the v.h.f. bands.

144 Mc.: John 4RZ is keeping us in touch with developments of Oscar HI. He is compiling a list of stations likely to be looking for Oscar and so far has the names of 16 VK4 stations. Two call signs appeared this month (June) that have been quiet for a while. Bruce 4ZCM, working from Clontarf, and Ross 4ZAT, from Moreton Island. QSB has been noticed on Ross' signal even though he is only about five miles away, but this five miles is all over water.

General: The monthly meeting of the V.h.f. Group was held on Friday, 19th June, and Mr. G. Kirkegarde, of the P.M.G. Dept., gave a talk on Interference in Radio Communications. Although the attendance was down to what it usually is, those present enjoyed an informal lecture and the usual refreshments afterwards.

Any of the v.h.f'ers who are expecting QSL cards and who do not attend meetings are asked to get in touch with Tom 4ZAL and by posting a few stamps to him, he will be happy to return cards to you.

What is Des 4ZJR doing with the four QQE06/40s he owns?

Predictions: With a little effort on their own behalf and supreme bulldozing effort on the part of others, precipitated by a severe psychological attack to shock the same nerves into action, we confidently predict a smoke test from Wayne 4ZBN, Colin 4ZHC, Barry 4ZMB and Ross 4ZRD in the near future! (With apologies to the Bundaberg Amateur Radio Club.)

George 4ZLG wishes me to advise that he and his XYL Joan will be going on holidays in November. They will be leaving Brisbane on 7th and returning on 26th. (George tells me he is booked on the ferry over to Tasmania on 9/11/64 returning on 24/11/64.) George hopes to be running 8-10 watts from his mobile and will be going to VK7 land via VK2 and VK3. He will be calling CQ all the way and hopes to work many of his old friends. 73, 4ZPL.

NEW CALL SIGNS

APRIL 1964

VK1JR—J. R. Watson, 64 Swinden St., Downer, A.C.T.
VK2GM—R. Hookway, 76 Campbell Hill Rd., Chester Hill.
VK2ADD—D. C. Reynolds, 13a Yarra Drive, R.A.N.A.S., Nowra.
VK2AMG—L. R. Burston, 51 Ellery Pde., Seaforth.
VK2AMI—F. J. Carey, 142 Seville St., Fairfield.
VK2ATQ—Chrstian Brothers College Radio Club, Crown Lane, Wollongong.
VK2AXK—D. L. Kinsella (Rev. Bro.), Christian Brothers' College, Crown Lane, Wollongong.
VK2AYI—S. Clark, 11 Stewart St.,. Arncliffe.
VK2AYQ—Yass Amateur Radio Club, Station: 23 Pettit St., Yass; Postal: Pritchett St., Yass.
VK2AZQ—M. D. Legg, "Wirringulla," Bronia Rd., Bullaburra.
VK2ZIA—I. P. Cork, "Glen View," Wollombombi, via Armidale.
VK2ZKB—R. K. Beckley, 102 Pacific Highway, Belmont North.
VK2ZKT—K. A. Thomson, Avondale College, Cooranbong.
VK2ZLM/T—L. O. May, 36 Tasker Ave., Campsie South.
VK2ZMA—I. A. Morris, 11 Felton St., Dundas.
VK2ZPD—P. K. Doman, 16 Wingello Rd., Miranda.
VK2ZPT—P. J. Lockley, 670 Pennant Hills Rd., West Pennant Hills.
VK2ZSB—S. A. Brunette, 67 Bungan Head Rd., Newport Beach.
VK3US—R. S. Clarkson, 26 Stewart St., Brunswick, N.10.
VK3AHF—Robert (Tex) Morton, Portable, C/o. Victorian Showmen's Guild, 106 Queensberry St., North Melbourne.
VK3ARG—R. G. Foord, 596 Thompson's Rd., Norlane, Geelong.
VK3AWL—J. P. Hunter, "Brooklyn Hostel," Millers Rd., Draytonville.
VK3AZW—T. E. Woolley, Flat 3, 27 Southey St., Elwood.
VK3ZBB—W. I. B. De Mel, 98 Gatehouse St., Parkville.
VK3ZBR—B. D. Yeoman, 6 Bank St., Ascot Vale.
VK3ZKW—I. J. Battersby, 1 Irving St., Mt. Waverley.
VK3ZTR—T. R. Chappel, 100 Coronation St., West Footscray.
VK4FK—G. W. Fox, 102 Wandal Rd., Rockhampton.
VK4RP—Clontarf Beach High School Radio Club, King St., Clontarf Beach.
VK4UC—C. T. Taylor, 66 Georgina St., Woody Point.
VK4VQ—E. V. Avenell, Bray Rd., Lawnton.
VK4XY—G. G. Down, 57 Gearside St., Everton Park.
VK4ZJA—D. W. Asmussen, 2 Raffles St., Mt. Gravatt.
VK4ZKC—K. Chiverton, 17 Fairmeadows Rd., Nambour.
VK4ZMB—B. J. Mayfield, 14 Charlton St., Ascot.
VK5WD—J. D. Ward, Flat 2, 102 Partridge St., Glenelg.
VK5ZDM—D. M. Roberts, 15 Daws Rd., Mitchell Park.
VK5ZMH—I. W. Cowan, 25 Nitschke St., Elizabeth Grove.
VK5ZNH—R. E. Burns, 5 Orchard Court, Newton.
VK5ZPW—W. B. Pywell, 17 Swaine Ave., Rose Park.
VK5ZRC—I. R. Cooper, Saltash Ave., Christies Beach.
VK5ZTS—E. T. Schoell, 33 Avenue Rd., Highgate.
VK6ZBB—W. E. Olsen, 6 Margaret St., Ashfield.
VK6ZEE—W. G. Wylks, 22 Margaret St., Cottesloe.
VK6ZED—R. B. Pemberton, 239 Jersey St., Wembley.
VK6ZEG—W. R. Godley, 69 Armadale Rd., Rivervale.
VK6ZEP—P. C. Pemberton, 239 Jersey St., Wembley.
VK6ZEW—Wesley College Radio Club, Coode St., South Perth.
VK9JK—J. A. Knoebel (Father), Catholic Mission of the Holy Trinity, Mt. Hagen.
VK9HS—N. E. Parsons, Portable, C/o. Ansett M.A.L., P.O. Box 278, Lae.
VK9OM—O. D. F. McCutcheon (Rev.), 12 Coronation Drive, Lae.
VK9WP—W. A. P. Luke, C/o. Radio Station, Nauru.
VK9RW—R. A. C. Washington, Vanimo, T.P. N.G.

ERRATA

Readers are asked to note the following corrections (owing to incorrect copy supplied to this magazine) to Call Signs previously published.

In the January list (published May "A.R.") VK3ZAV should be VK3ZAU. Also VK4ZLI should read VK4ZJL.

In the February list (June "A.R.") VK2GF should read VK2ZGF.

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AMERICAN CALL-BOOK

The Federal Treasurer W.I.A. has for sale at £1 post paid recent back numbers of "Call-Book Magazine". These, at less than half price, have been used by Federal Officers and most are in new condition. Apply Bob Boase, VK3NI, 50 Cardigan St., Carlton, Vic. Only the edition listing American Amateurs are available at present.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

Full rules and log proformas for the 10th European DX Contest may be had from this Bureau. Contest periods are: c.w., 0000z, 8th Aug., to 2400z, 9th Aug.; phone, 0000z, 15th Aug., to 2400z, 16th Aug.

Stan VK3AWX is now acting as QSL Manager for John, VK4JQ. Stan replaces W6HYG.

Cards from PK2ET are coming to hand via the D.A.R.C. These indicate that the operator is or was Johnny DJ4IC and the QTH given is Solo, Java. QSLs must go ONLY via DJ5QK direct or via D.A.R.C. PK2ET has not been heard since April last.

Al Scarlett, W2CC, has returned to his home QTH after a trip to England and all Scandinavia. Al enjoyed the trip despite continued wet and cold weather and has resumed his skedding with VKs 2OJ, 3HL, 3RJ, 3XB and 5BO.

—Ray Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

Winter draws on, as one of our members was heard to remark at the last meeting and since some are not so well equipped for the icy blast, the attendance was below the usual number. However, there were 28 members, associates and visitors present to hear and see a variety of items of wonder and delight. As you may have heard, Lionel 2CS was smitten with the dreaded wog and was unable to give his proposed lecture on the crystal locked converter. There were some items of equipment for auction and your scribe dispensed with this section of the proceedings, Gordon being absent. Those who partook were delighted with the bargains they took away and one, Tom Davis, has said that at the next meeting he will offer for sale some of his surplus gear. Those familiar with Tom's vast stock of bits and pieces will know to expect a really super auction night next meeting. The July gathering continued until 10.30, there having been discussed various topics including broadcast transmitter aerials, transistor television and computers, the latter topic being ably treated by Tony 2ZCT.

The absence of several of our members was due to sickness of one or both parents, and to those who are so distressed, go the best wishes of us all.

Of course the wog aforementioned has stricken the most hardy of us and when Frank 2APO lies abed for days, things are really at a low ebb. To add to his discomfort came the publication of a certain feature article in the local daily. Our confederates in G land would dub it a real smasher, and it was! The type of newspaper comment that makes everyone both laugh and learn at the same time, indicates journalistic skill of the highest order and congratulations go to YL Jennifer for her splendid effort.

Jan, who because of his name, is sometimes mistaken for someone else, and has at last received his new call. He has made an excellent start signing 2BJO from Awaba at week-ends on phone, and from Sydney during the week on c.w. Susan 2BSB, Jan's contemporary in Amateur Radio, still radiates a good signal on 160 although the monitor doesn't always say so.

Three of our local members are going about their everyday tasks with an expectant look—waiting for the results of the July exam. So as not to make their suffering any greater, I'll refrain from giving the finer details until the notification arrives.

The broadcast from 2AWX always includes some DX news and a recent test indicated that nobody listens to this section. If this statement leaves you wondering, listen again—but carefully this time.

Many of the local boys are preparing their rigs and stocking up on extra coffee for the R.D. Contest. Remember it's less than a fortnight away and every log submitted gives VK2 a bit more chance, so why not give some of the high scorers a fright by coming in first, unpredicted. Jim 2AHT doesn't mind some opposition and every point helps. The wild Irish rose from Toronto had better put up a good showing now that he's set the standard with the AXU string aerial and the bucket of bolts. Fancy a better signal report than those with scientific rigs and 100 per cent. modulation! But still he cannot circumvent the man with the bow tie bird perch, complete with traps. For those uninitiated, this is Bill 2ZL, who now goes as well on 80 as he previously did on 40.

At Westlakes, the boys have been digging in to the work and the buried coax is in place with fancy termination boxes at the output ends. Due to the good properties of the earth at the club, it may happen that 2AWX broadcasts could originate from there in the future. Much depends on the successful erection of the vertical for 180. However, somnambulists beware! There are many trip wires laid in strategic places around the club house.

The annual hibernation is in progress at Cessnock and nothing will be heard from there until the spring, at least. There was a rumour that Chris was to use an old starter motor to swing the beam—but where is the beam? In all honesty, the lads from the coaly city are kept pretty busy with the Civil Defence activities for which they are to be commended.

It was expected that there would be a 160 mobile signal on from hereabouts, but due to an inversion of the power source, this is now a remote dream. The morse classes at the club are still progressing very satisfactorily and the boys should pass the c.w. in January if nothing else.

Details of the dinner and field day for this year are to be published next month. Members will be pleased to learn that, contrary to accepted practice, costs will be lower this time than last. Also there will be a further saving for those who book early, but more of this next time.

Remember the next meeting when Lionel will talk about the converter and tuneable i.f. receiver which was planned for July. We will be present in room 6 (or room 15) classroom block, Newcastle Technical College on Friday, 7th August, at 8 p.m. Don't forget the auction—it promises to be a beauty. So see you there. 73, 2AKX.

CENTRAL COAST ZONE

Major 2RU's lecture on "Receiver Alignment and Servicing" at the June meeting of the Gosford Radio Club was well received. The latest printed circuit transistor set was passed around to illustrate modern construction techniques.

Phil 2TX is now experienced in the construction of 432 Mc. g.d.o's. Geoff 2XA is embroiled in t.v. servicing, but manages to get on 80 sideband with the HT37. Doug 2ASA is another of our ranks to have trouble with quads in gales. They're expendable, man, that's the way to look at it, well, repairable anyway.

Commercial transceivers are very popular on the Central Coast. I believe Swan-type signals now emanate from 2NI and 2IN (no misprint). Haven't heard the latter's signal, myself. Ernie 2EH still enjoys a c.w. contact and has a regular sked with Mona 2AXS. Alex 2AAK and Mona had an interesting trip to Melbourne and Warrnambool recently, operating s.s.b. mobile on the journey. Arthur 2MJ at Ettalong uses a home-brew s.s.b. tx and is often heard on 20.

Reg 2AI is always coming or going. I'm not sure if it's to VK3, 2 or 4 this week. He is now qualified to write a book "Travel in Australia". Lord Howe Island is on his list soon, a holiday is planned, and it may be that the pine tree which formerly held Graham's antenna will get further exercise. Heard Major 2RU on 7 meg. mobile recently. The signal was good clear sideband, so the bugs must have departed. Major was stunned to hear his cobbers 2ZX and 2BZ operating Swans on 80 the other night.

Wally 2AXH now has an antenna again (bamboos blew down), but the tx is still being re-built to eliminate Indians. Norm 2ALJ and I visit him from time to time. Frank 2AFJ is now instructing his son in radio and with a number of retired b.c. sets I think he will be able to make an all-band tx. Ken 2AFH and George 2ADZ span the ether regularly on 80. Your scribe is still madly making guy wires for a crank-up tower. Will the mast be ready before the quad elements wear out from exposure, that is the question! 73, 2ON.

VICTORIA

WESTERN ZONE

The Western Zone has gained two new members, Perce 3PA, who comes from Preston, and now resides in Horsham, and Alex Proudfoot, who is to be congratulated for obtaining his full licence at the last examination. Herb 3NN and Gary were two members of the Western Zone who went to the South Australian V.h.f. Convention at Mount Gambier, and two others, Harry 3ZX and Mac 3AZM attended the S.s.b. Convention at Hamilton.

The Western Zone also has many short wave listeners, listening in to the Wednesday night hook-ups. One, John Tilbrook, informs me that signals are all heard well up at Lacelles.

On the DX side, Harry 3ZX has worked quite a bit on 20 and 40 metres s.s.b. Herb 3NN has worked 5AB on 432 megs. Merve 3AFO has purchased a 40 ft. tower and intends mounting a 20 metre quad for working on this band. On June 21, the Western Zone held a satisfactory W.I.C.E.N. exercise. 73, 3ATS.

MOORABBIN AND DISTRICT RADIO CLUB

Although there has been a lack of news recently, there has not been any lack of club activity. Quite the contrary, as the clubrooms have had standing room only (almost) at recent meetings. One new member brings membership to 75 financial types, plus several unfinancial types who could be assured of the best seats and no questions if they remitted the overdues now. Besides, they have missed several excellent talks on such things as transistors, test equipment, etc., and very enjoyable "White Elephant" nights in the past few months.

Amongst the many coming events on our itinerary are a visit to fellow club member Bruce 3BM at Quambatook in October, the 80 metre tx hunt on 7th August (yes, Walter, I'll have the gear ready—famous last words, he says?) and a theatre night to "Camelot" in September.

Each year we take a big part in the Jamboree-on-the-Air and this October most of the active members are already committed with Scouts and Girl Guides (flowers on the receiver?. They're another year older, remember!). The troop that came to my shack last year have continued with paper QSOs with Claude 4UX and his XYL and a ZL since, so I think that this day adds a lot to the exchange of Scouting ideas.

Quite a number of club members are moving to 5PS' nightmare—s.s.b. Many teething troubles are being discussed at club meetings and many cures (?) suggested, so perhaps the club 80 mx net on Monday nights will go s.s.b.?? Listen to next Monday's net and hear (and enter) the next exciting episode in this ducky drama!

Now a call to all club members. Let's rally to the VK3 effort in R.D. Contest this year. If all active members spare at least a few hours AND send in their log we would make a big lift in this State's tally. Also we would be helping the Contest intention along. See you amongst the confusion in August?—Kevin 3ARD.

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QUEENSLAND

DIVISIONAL COUNCIL MEETINGS

A special meeting was held on 17th May to receive an interim report on this year's Federal Convention. Peter 4PJ gave the report. Peter feels that having made the acquaintance of the Federal Executive and Divisional Councillors, administration of this Division will be much smoother, Federal wise. He would like to confirm the opinion of our previous Federal Councillor (Al 4LT), "that we are indeed fortunate in having men of the calibre of Federal Executive handling our affairs—which I can assure members is in good hands." Incidentally, this Division will be host State for the next Federal Convention.

The monthly Council meeting was held on 4th June. Ron, our outwards QSL officer, reported that he has at last coped with the large backlog of cards. Membership is increasing at a steady rate and we hope that this trend continues. The R.D. Contest trophy which was won by VK4 last year has now arrived in the State. Council hopes to be able

to arrange for display of the trophy in all of the large towns in the State. Although other States will make efforts to take the trophy from us, we feel confident that it is here to stay for a while at least!

Council asks all VK4 Hams to remember Friday, 14th August. A Divisional Dinner will be held at 8 p.m. in the Oak Room, Maple Lounge, Edward Street, City, on this date. It is during show week and the cost is only 25/- per member, so we'll see you there?

JUNE MONTHLY MEETING

The June meeting was held on 19th at the usual address, State Service Union Rooms, Elizabeth Street, City. General business was very promptly disposed of in anticipation of a fine lecture. A lecture titled, "Electronics in Medicine" was given by N. H. Gabriel, B.Sc., M.B.D.S., D.P.H., A.R.A.C.I. The success of the lecture could be gauged by the fact that question time took up nearly as much time as the lecture! Your scribe did note that questions were answered free of charge, which is not the usual thing for the medical profession.

General News: Jamboree-of-the-Air will be along soon and the organiser for Scouts in Australia is Mr. Noel Lynch—one of our members. The Ipswich and District Radio Club have been having well attended meetings in the last month. They have several new members which are a direct result of the efforts of the club at the Ipswich Show. The club exhibit, which included a fully operational low-band rig, aroused considerable interest. Classes for juniors have been started and are well under way. The annual meeting, apart from the regular fortnightly meetings, was held on 9th June. In particular, the ladies committee is to be congratulated on the excellent supper that was provided by them. Norm, from Ipswich, was trying to work 10 metre DX into Brisbane recently, but how successfully we do not know.

Ken 4OF and Peter 4PJ have been busy getting No. 19 sets ready for emergency and mobile use. W.I.C.E.N. is in its infancy here at the moment, but it should be well on the way shortly with the appointment of a State Co-ordinator. Hal 4HB will be in England by the time you read this. He and his XYL planned to go via Hong Kong and Europe, returning via the States.

Long awaited membership certificates of the W.I.A. have arrived and one will be forwarded to each member aa soon as possible. Jeff 4XP is back on slow morse on 3504 kc. Claude 4UX stayed longer in Brisbane than expected. Only tonight I heard George 4GG being mentioned on 144 Mc. They were telling how in the days gone by, George used to transmit on the broadcast band. It is no wonder since George has been on the bands 34 years and recently turned 70. He is still quite active and from what I hear he doesn't even own a modulator.

The VK4 Division did receive a letter from Don 9DR thanking them for their efforts in helping the radio club on Christmas Island. The VK2 A.O.C.P. courses were very acceptable so he says. Don is quite active over the week-end in daylight hours. Frank 4FN, mayor of Gracemere, was mobile in Brisbane and was constantly looking for contacts. Well I shall close the news from this Division with a plea to all districts of Queensland. How about some news from your district for the 4WI Sunday morning news broadcast? Others want to hear of doings in your district. 73, Bill 4ZBD.

TOWNSVILLE AND DISTRICT

Although the drought broke in North Queensland, sorry to say the news reports on Amateur activity are still very scarce. In a recent round table talk with some of the northern chaps, the absence of the VK5 notes was very heatedly debated. Various inuendos were made that the blue pencil was the cause, but knowing that "Pansy" dearly loved having a shot at the Editor, in the various noted printed, I could not agree with them. Naturally, at times, I have had the blue pencil on mine, but always knew that he couldn't leave the paper open to some of my caustic remarks.

Claude 4UX really snowed under, correcting the various exam. papers for the youth clubs, and has Basil 4ZM finally roped in for the future to help out in correcting the elementary papers. Wasn't I lucky in being deaf when all this was being discussed. Bert 4LB very busy painting the new canes for the new quad he hopes to put up with the able assistance of Merv. 4ZMD. Yours truly will be there to offer advice and partake of the promised refreshments.

Very sorry to read in the latest official call sign list that the Townsville Amateur Radio Club has discontinued the call sign 4TC. What a shame it had to be, surely some of the boys were willing to help collect the necessary to keep the call sign intact? Hardly in keeping with the number of Amateurs that hold tickets in the second city of Queensland. Just imagine the Rocky boys when they spot the deletion, theirs being the fourth city.

Quite a number of the southern boys are in the north to partake of the tourist weather at this time of the year. Unfortunately not being on the main highway now, unable to meet them unless they detour. But as Basil said, "They all head for Cairns."

According to a headline in a recent Sunday paper, quite a long discourse was given in relation to t.v.i. in the Rockhampton area, caused mainly by two-way radio in the various business undertakings. This would gladden the heart of the local Amateurs as they were being wrongly blamed. The article went on to quote the local t.v. station manager that interference could be expected to some extent where there were channels between 0 and 3. The solution being to adopt the American system—no t.v. channels below 100 Mc. 73, Bob 4RW.

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SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division was held in the clubrooms to the usual representative gathering of members (for the benefit of the doubting Thomas' in the other Divisions, about 100 members, and a genuine 100 too!), and took the form of a buy and sell night, although it now goes by the somewhat pansled-up name of Jumble Sale, apparently to avoid the disgrace of any member of Council finishing up in the arms of the local constablurary, no constabblu—, no constabli—, oh well, to avoid being pinched (Heaven forbid!), and a good time was had by all. The master of ceremonies was Brian 5CA, occasionally assisted by our worthy President (Phil 5NN), who showed a somewhat unsuspected talent for wheedling the last shekel from out of the unsuspecting members present. He even talked me into buying an electric motor with the suggestion that it might step up the old revs. a little bit. Too late, brother! The spirit is willing, but the flesh is weak!

Anyway, it was quite an entertaining night for all and although I could go on padding

the details for another couple of pages, perhaps I had better pull my head in, because after all the venerable Ed., you know, the one with the golden spectacles, still has me on probation, and I would not like him to think that I am nothing but a padder!!

Very little business was transacted, and the little that was discussed was purely of a local character, so let us pull down the curtain on the details of the meeting, wake up the sleeping members, and send them all home to their couches of virtue, and let them await with eager anticipation for the next meeting.

Could not help but notice the number of older members present at the meeting, by older I mean those who in the past have pulled their weight on Council or in other fields of activity for the Division. Two ex-Presidents in Lloyd 5OK and John 5KX, as an example (a somewhat dubious example, but still an example!) and also Wally 5DF who was down from Leigh Creek on vacation and fluked a general meeting for once. It is good to see this type of older member at the meetings, including me, because far too many ex-officers of the Division drop out of office holding and disappear into the never-never, and very little is ever heard of them again. What's that? It might not be a bad idea if I disappeared into the never-never. Oh is that so. Cut out the flattery, it will get you nowhere!

Was driving along Grote Street the other day and had to jam on the brakes to avoid running down an athletic young man who was dodging out and in of the traffic like a six-day bicycle rider. Yes you have it. None other than Johnny 5KO, looking younger than ever. How do you do it, Johnny? Eating peanuts? Oh dear, there's that twitch again, and I am nowhere near a Morse key!!

Another ex-official at the meeting was Keith 5KH, my favourite banker, you know, the one who always leaves the vault open whenever I call on him, although I must admit the compliment is somewhat dimmed by the sight of the 303 on bis desk, pointing right at my fallen chest too! Judging by the gear he bought at the meeting he is still interested in the game.

Listened into the usual sked of Frank 5MZ and Carl 5SS on 7 Mc. the other night and discovered a newcomer in contact with them in Moss 5TU. Taking the general hilarity of Frank and Carl as a general guide, I formed the conclusion that Moss had constructed some form of a Frankenstein Monster which was gradually destroying his usual good temper. He called the monster a Z Match, and if his attitude and cheerful outlook to his troubles was any indication of his keen approach to Amateur Radio he should go a long way in the hobby. Nice to hear you Moss.

Dave 5DS, my favourite Scotchman, joined in the QSO later on and his keen ears picked up some callers in the background trying to break in and they turned out to be Ray 6WU and Jeff 2QC. When I backed out for my evening meal, the QSO was going on in full strength, and for all I know could still be in progress.

Never one to be sidetracked by coarseness, abuse, or even velled sarcasm, it is with pleasure that I am now able to announce to my army of enquirers—oh well, if you insist—to Les 5NJ, that the frequency meter is to be placed in the custody of Garry 5ZK as part of 5WI, and will be available for frequency checks upon application. Well, there you are Les, I always get my man.

Whilst the VK5 notes in the magazine have been in recess, most of my under-cover agents have gone into smoke and are taking some getting back on the job. Uncle Tom 5TL, who usually wrote to me from his shack on the Murray River, around Renmark, is one in particular, and after detailing my agent number 14895737872293458 to the job of finding him, I was reliably informed that Tom has migrated back to the "Big Smoke" and is hiding up at the Glenelg Post Office. His QTH is given as Glandore, and although my above-mentioned agent tells me that this could be the Glandore Industrial Home, I feel that this is only a rumour, or malicious gossip. Tom—take a little less tea drinking one day and tell me the awful news—please.

You all know the old saying, "If a dog bites a man, this is not news, but if a man bites a dog, then it is hot news". Well, news has reached me that none other than Tubby 5NO is nibbling at s.s.b. Shocked to the core, and extremely mindful of his pointed remarks at times concerning the "holier than thou brethren," I immediately took steps to investigate the allegation. When I tackled him at the meeting he seemed a little shifty about it all but finally made a statement to the fact that he had seen an s.s.b. rig and receiver around the shack, but was not impressed with s.s.b. Although he sounded quite sincere about it all, I cannot quite get the fact out of my mind that he seemed anxious to bring the conversation to an end as quick as possible, and upon the arrival of his son and heir, Jeff 5ZP, laden down with a parcel of QSL cards, they both backed away and almost ran out of the building. I wonder—I wonder!

Talking of s.s.b., and who wants to talk of s.s.b. Arthur 5HY sat next to me at the meeting and definitely brainwashed me on the subject of s.s.b. So much so, that I now have the address of a VK2 who supplies transceivers and am also half committed to a visit of inspection of the shack of a well known s.s.b. enthusiast in the Prospect area. No wonder they used to say in the early days of radio in VK5 that Arthur could sell icechests in the north pole, he was that good as a salesman, I quite believe it. I tried to keep our voices down during the thesis on s.s.b., but someone is bound to have heard some of it, and if so the cards are being stacked against me. Oh dear me, oh dear me.

One of the first things that I did after resuming as VK5 scribe for the magazine was to tune into 7 Mc. around 5.30 p.m. to the regular sked of Jack 5LN and Athol 5LQ, quite sure that their conversation would give me the usual source of several paragraphs. I hunted there, I hunted here, in fact I hunted everywhere, but not a sign could I find of them. Somewhat puzzled, I investigated the matter and was amazed to find out that they had migrated to 3.5 Mc. Whilst they strongly denied the move was made to prevent me from reading their mail, the smug look on both of their faces when tackled makes me decidedly suspicious. What frequency did you say you were on? Oh you didn't—OK—I can take a hint.

Jim 5JK fully restored to health these days, although if rumour is to be believed, he had the electrical installation in his QTH fiddled up and ever since he has been bothered with some b.c.i. right in his own kitchen and elsewhere in the house. My suggestion that he have the installation unfiddled, brought the response that it probably deserved it. Well, I was only trying to help!

John 5KX reported as being seen on a mobileering tour of Kangaroo Island, and to confirm my oft-repeated statement that no matter where one goes, one can always bump into a fellow Ham, John bumped into Gil.—sorry—Gilbert 5GX on the island. Rumour further has it that Gilbert was well and truly whooping it up on the island, as a matter of fact I believe he was even seen walking down the main street at Kingscote brazenly eating a double ice cream cone. Gilbert—watch yourself, OM!

Back before the "Great Misunderstanding," I mentioned in the magazine that a visitor at one of the VK5 Divisional meetings was announced as George Glover, and how I immediately ducked for cover, thinking that the George Glover 3AG, one of the wise men from the East, was over on vengeance bent. It is with regret that I announce the death of the VK5 George Glover (ex-G3FMQ), who was accidentally killed in a motor accident one night recently after work. Although intending to become a VK5 he never quite got round to it, but has been heard frequently from the QTH of Arthur 5HY, with whom he had become firm friends. The Division regrets the sad news and extends to his relatives their sincere sympathy in their bereavement.

The well known lunch-time session on 7 Mc. seems to be breaking up. I have listened at various times on the band but nary a thing have I heard. Pete 5FM is reported as being on s.s.b., although I have not heard him as yet. Tom 5TL, as reported elsewhere, has left Renmark, poor old Luke 5LL has passed on, which somewhat depletes the members of the session. A pity in a way if the session has broken up, it was a good meeting place and it was remarkable just who bobbed up now and again on the session. Let's hope I am wrong in my assumption that the session is fading.

An old chestnut turned up at the meeting. I was asked by one of the new members why the weekly notes in the local "Advertiser" never seemed to mention many of the local boys or their contacts. In view of the fact that other members might be thinking along the same lines, I hasten to assure them that if any local Amateur ever does something that can be classed as news from the viewpoint of the general public, I would not be able to print it quick enough, but unfortunately Mr. and Mrs. General Public is not one bit interested in knowing that Joe Blow 5XYZ had a contact over the back fence or something along those lines. The column in the "Advertiser" is meant to be the front window of Amateur Radio as a whole, in an endeavour to give it an image and a build up, which sometimes it grieves me to say, some of the gang do not live up to, and it is only by printing the doings of the great, and near great, that the image can be sustained. With this in view, the more Kings, Princes, possible Presidents, etc., etc., that I can put in the column, the more I will succeed in convincing the general public that the average Radio Amateur is not a be-spectacled moron who spends most of his time up in the attic talking to the bats and the mysterious persons who seem to inhabit their immediate portion of the earth. Can you honestly see anything against this policy? Heaven only knows we need such publicity these days. Oh, I almost forgot, this is the policy of Council and not mine alone, and you all know how obedient I am to the wishes of that August Body!

Talking of the "Advertiser" notes reminds me that one of my paragraphs each week has to do with s.w.l. news. In view of this fact several of the boys have asked me at times what has become of that ace s.w.l'er Jim Paris these days? Well Jim is in the pink and happily married and is still keen on the game. He is of course the official B.B.C. observer for VK5, if not for VK, and always manages to keep me supplied with news for the above-mentioned paragraph.

I notice in the last copy of "Info," the official magazine of the Elizabeth Amateur Radio Club, that Tubby 5NO has retired from the position of President, and his position has been taken by Colin 5ZHJ. Tubby has done a good job during his long presidenecy and it is unfortunate that pressure of business caused his retirement. Congratulations to Colin and the best of luck in the job. Tubby, although officially withdrawn from the position of Editor of "Info," has agreed to contribute his services as technical advisor. Nice work.

The re-shuffle mentioned above also means that Hugo 5IB has taken over the position of QSL officer to the club from Colin 5ZHJ and Jeff 5ZP. I notice that the old stalwart, Ron 5FY, is still the awards manager. It looks like they will have to shoot him to get rid of him. Jokes aside, Ron has done a terrific job for the club and has my admiration for such long service. Incidentally, Colin's elevation to President left a vacancy on the committee which has been ably filled by Don 5TM who is reported as still feeling the effects of the arm twisting!

Vern 5VB, better known in these notes as the "Admiral" (ex 5ZAH), has been disporting himself with his new call and the opportunity of working on the square bands. Congratulations Vern, it was worth waiting for, was it not?

Talking of the "Admiral" reminds me that I have just received a card from Brian 5BI for our contact at Oakbank. Thanks OM, but did you have to put "At Last!" on the front of it, to say nothing of the pansy on the back in full bloom? People will think I am never on the air!

Leith 5LG noticed at the meeting sitting quietly and sedately a few rows from me. I never thought the day would come when I would type the words quiet and sedate as applying to him. However, when asked how he was feeling, he gave quite an Academy Award act of a brass monkey, so apparently that was the reason. Me too, brother.

That athletic and photogenic gentleman sitting at the main table industriously writing every now and then at the meeting was, I presume, none other than our new minute secretary, Murray 5ZQ. I say presume, because although I know him by sight and have spoken once or twice, the name or the call did not ring a bell when I read of the appointment in the journal. Anyway, nice work Murray, and if I am wrong in my presumption, it at least made a paragraph. Put that red pencil down at once, you cad, Sir Ed!

Although John 5KX is getting his fair share of publicity in this month's notes, I cannot keep the fact secret for next month of the fact that he is off on a world jaunt some time next year, strictly business of course. My suggestion that he would probably want someone to carry his bags received the usual coarse reply and only goes to show that in their conversations with me, these ex-Presidents manage to shed their veneer and come down to my level!

Called in to see Clem 5GL the other day with a crystal query and whilst there, Doug 5DW came out of the back room and had his usual insulting conversation at my expense. As a matter of fact, he is an ex-VK3, but I don't hold that against him. After all, they can't all be like Pincott. Clem lifted my ego somewhat with the remark that his XYL was wanting to know when I was going to write for the magazine again. Ho hum, my fatal beauty again!

Another one to walk into the shop was that staunch supporter of s.s.b., none other than Doug 2DQ, who informed me that he had just flown down from Broken Hill. I looked long and hard for his wings, but he was so sartorially perfect, that the wings, if he has any, were covered up too well. Good to see you Doug, even if you do spend a deal of your time on the air insulting me and my old-fashioned mode of telephony. Gercha!

Noticed a pair of rascals from Port Pirie at the meeting. Yes, you guessed it, Bruce 5MC and John 5ZC. I asked John how he liked Pirie and he was enthusiastic on the subject. Nice work, OM. Good to see you again.

Also noticed Joe 5JO at the meeting looking fit and well. Have heard him at times on 7 Mc., and without doubt he still retains his enthusiasm for our grand old hobby. Keep up the good work, Joe.

Just as I was about to put these notes to bed, I received a command from Council to warn all members of the present trend in the fashion world. They asked me to word the warning myself, and whilst I must admit my ignorance of present trends in fashions, I will do the best I can.

Members of the VK5 Division are warned to ignore present dress fashions, especially the new bottomless evening trousers. Members are also warned that should anyone brazenly attempt to wear such bottomless trousers to any of the meetings, Council will be forced to take a stern view. [This would no doubt lead to a real bust up if the full outfit "new style" was worn.—Ed.]

Oh well. They can't say I did not try to do my best. 73, de 5PS—PanSy to you.

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WESTERN AUSTRALIA

This month we find not very much news having come forward, so we will have to use that which we have and fill in the rest from observations.

The general meeting was held on 16th June and the attendance was lower than usual, but when the weather conditions are looked at, we can realise why. It was raining very heavy with very strong winds blowing. It was very pleasing to see Cyril 8CN down at the meeting and he seemed to enjoy talking to the various members afterward while enjoying a cup of tea and biscuits. Just in case you were not aware of it, we hold our meetings every third Tuesday and we do have tea and biscuits at all meetings, so what about coming along to swell the numbers and let your Council know what you are thinking.

We do have some very interesting points brought out before us in the line of social jottings. It was quite interesting to note the paper being used for letter writing by one member—"scented with flowers in the corner."

Clem 8CW has his tower and beams up and we do hear him around a little now. Jim 6RU has removed his tower and beams in preparation for moving to his new QTH. He is at present using a ground plane on 20 and reports that the only noticeable difference is on reception and not on transmission.

Another item which is of interest is that Channel 2 from Adelaide has been received in Albany and I believe that Channel 0 has been trying to give some viewers variety in the West.

The W.I.C.E.N. net is growing with more of the f.m. two-ways being commissioned and I believe that the list around the metropolitan area includes 6ZEZ, 6ZEE, 6ZEA, 6ZBD, 6ZDW, 6MM and possibly quite a few more which are not to hand.

We are told that we should publicise the Amateur Service, however sometimes it pays to think as to how far the publicity goes. Some of the more energetic types made a trip down to the Albany districts to visit a place called Bluff Knoll. After having struggled to the top of this knoll, some 1½ miles nearly straight up (so we are told) the party arrived at the top. What should happen but another party consisting of several of the female type were already up at the top and when they spied the Amateur party nearly all of the females exclaimed "Tom!" (6DP).

One should think about who keeps the Division's finances because when they use locks they should remember such things as keys, shouldn't they? Barry 6ZCF happened to wear Alyn's overcoat from his car to the meeting room at the last meeting and the obvious happened, he left his car keys in Alyn's pocket, and Alyn went home before Barry. Just as well that someone else with a car had not gone home and was able to act as a taxi.

Now if you have not got your gear working by this time, you had better arrange to use someone else's for the R.D. Contest as it is only a fortnight away.

Must sign off now chaps, but remember I would like more news to write about, so till next month, 73, Roy 6RY.

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TASMANIA

Here it is at last, R.D. month. The week-end of 15th and 16th August. Remember the opening ceremony will be broadcast from 7WI at 1745 hours on the 15th. Wholehearted participation and log submission is your Council's request. Don't leave it to the other chap. If we "have a go" I feel quite confident we can once again hold that trophy in VK7, so what about it, let's give the other Divisions a run for their money.

This 'flu we've been having here in Taasy appears to have struck with a vengeance at W.I.A. members. (I thought we'd be immune to most things.) The June v.h.f. meeting was attended by five members only (none of whom had keys to the clubrooms). Terry 7CT had to cancel his A.O.C.P. class one week, couldn't get out to the rig for the Sunday 7WI rebroadcast. Len 7LE, who was to lecture to the July general meeting on "Predictable Long Distance Radio Communication via the Satellite Ionisation Phenomena" (phew!), had to postpone same due to the wog. Just as well perhaps, quite a few others were away also, including yours truly. The substitute lecture consisted of tapes of the Hamilton (Vic.) S.s.b. Convention, which I am told were very interesting indeed, even though some of those present persisted in showing their ignorance by talking among themselves.

We have two other new Z calls in VK7 now besides Anne 7ZYL, whom I mentioned last month; they are Winston Nichols (7ZWN) and Greg Power (7ZGP). Both these lads are from the top end of the island and my spies tell me they are already making their presence felt on the air.

Our old friend, Crosby 7CW, has gone on a round-the-world trip (half his luck) and plans to be back in October. I expect we'll see a few choice pieces of overseas s.s.b. equipment when he returns.

Sid 7SJ will be Branch Manager for his firm (an Aust.-wide wholesaler), at Geelong, by the time this is published. Good luck Sid in your new position.

Ted 7EJ can now be understood (?) on s.s.b. since he limited his audio bandpass, and the other Ted 7EB, who owns an AR88, tells me it's not a bad receiver since he replaced a 33K screen resistor that had gone to 100K—he can even hear some of the stations that Ian 7ZZ works.

Charlie 7KS has a new whip on his mobile and has a really f.b. signal now on 80, while Ken 7LL has been occupying the ether again with good signals on both 80 and 2 metres. Keep it up, Ken, good to hear you on again.

Enough for now, don't forget R.D. Contest and post your log. 73, Geoff 7ZAS.

HAMADS

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FOR SALE: Glovebox Mobile 7 Mc. Transmitter and Converter, 8" x 5" x 3½", complete with genemotor, loaded whip, microphone. W2EWL S.s.b. Transmitter as per S.s.b. Handbook, no power supply. Type 3 Mk. II. complete coils, spare tubes, modulator, speaker, xtal mike, etc. Sundry other gear. VK3AHG, D. Gilder, 11 Gleeson Ave., Burwood, Vic. Phone 29-7609.

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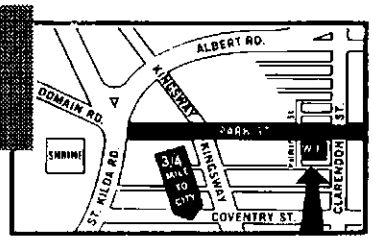

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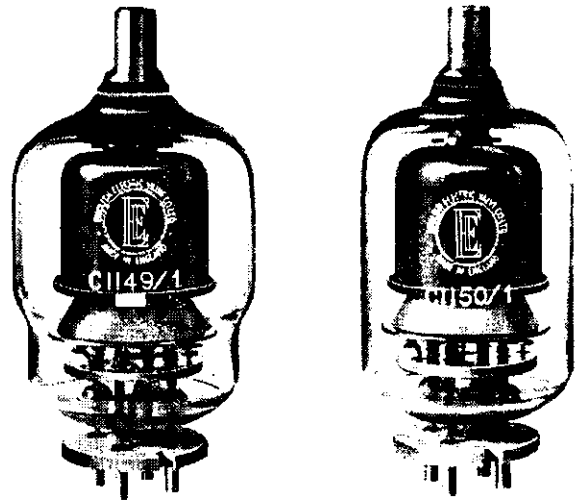

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C1149/1 C1150/1

AMERICAN ELECTRICAL EQUIVALENTS

4PR60B AND 715C

ENGLISH ELECTRIC

GENERAL DATA

Electrical	C1149/1	C1150/1	
Heater Voltage	26	26	V
Heater Current	2.15	2.15	A
Cathode Heating Time (Min.)	3.0	3.0	minutes
Mechanical			
Overall Length (max.)	6.00	6.00	inches
Overall Diameter (max.)	3.062	2.598	inches
Base	B4A	B4A	
Mounting position	Any	Any	

TYPICAL OPERATING CONDITIONS

	C1149/1	C1150/1	
Duty Cycle	0.001	0.001	
Pulse Length	2.0	2.0	μ sec
Anode Voltage	20	15	kV
Screen Voltage	1.25	1.25	kV
Grid Voltage	—600	—600	V
Pulse Positive Grid Voltage	150	100	V
Pulse Anode Current	18	15	A
Pulse Screen Current Approx.	1.7	2.0	A
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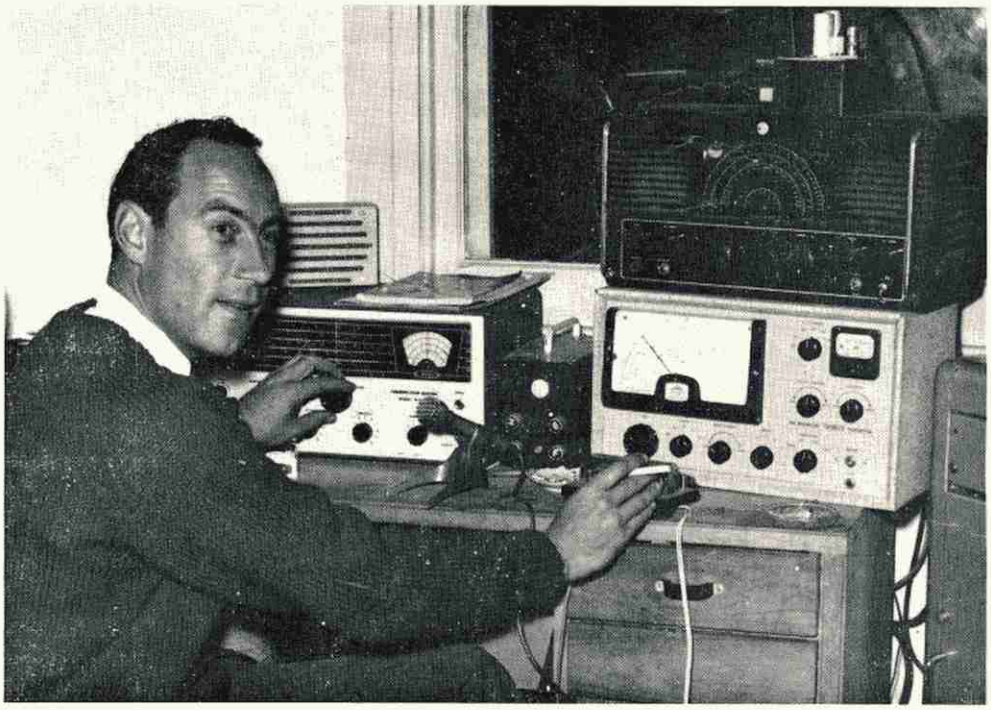
AMATEUR RADIO

SEPTEMBER 1964



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"AMATEUR RADIO"

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THE EDITOR,
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EAST MELBOURNE, C.2, VIC.

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★

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★

Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

★

OUR COVER

Shows A1 Penny, VK5ZC. More details are given on page 15.

FEDERAL COMMENT

★

WHAT'S IN A NAME?

From his early beginnings the Amateur has been acclaimed for his ingenuity, inventiveness and will to experiment. He built his receiver, his transmitter and cut and erected his antennae. He built his own test gear and experimented with bread-board layouts before finally building his gear into its eventual chassis. Since the second world war, these activities have largely ceased. The commercial transmitter and receiver and even antenna is now commplace in the Amateur's shack.

What are the reasons for this change in perspective? Is it due to the surfeit of Amateur commercial equipment on the market? Is it due to the Amateur now having less time on his hands to build new gear? Is it due to a flush economy in which it is cheaper to buy commercial than build Amateur? Is it due to the demands for more exacting standards in Amateur equipment brought about by large increases in the Amateur world population? Is it due to more complex and elaborate equipment requiring greater frequency stability and flexibility? Or is it due to just sheer laziness?

The only field perhaps that has not been so largely influenced by commercial equipment is in the u.h.f. and s.h.f. fields, although the inroads of commercialism in this part of the spectrum are also evident, particularly in the U.S.A. In any so styled analysis of this sort, one has to ask the obvious question—is this a good or bad state of affairs for the Amateur? In many ways, the availability of commercially made Amateur equipment is a good thing—it gives him more on-the-air time, he can treat his hobby more as a relaxation instead of labour and he now has a signal that is neither over-modulated or putting out an R.A.C. note. On the debit side, however, he is now less technically inclined, will probably have to send his equipment to the supplier if anything goes wrong and perhaps worst of all is losing his incentive to experiment and improve his gear.

This indictment of the Amateur's inventiveness and ingenuity is only a general and not an individual one for there are still quite a large percentage of Amateurs who still like to build their own equipment. New fields in Amateur communication have nearly all been due to the experimental work of devotees to the "old ways"—a good example being the building of the Oscar III. translator satellite transmitter of which we should hear a lot more in the coming months. One might also add, in fairness, that most Amateur commercial gear is built and tested by Amateurs for Amateurs. It would also be true to say that many of the Amateurs who have commercial gear today are those older members who have graduated from the old bread-board, now have less time for home construction and like to use Amateur Radio as a relaxation.

Despite the arguments for and against the use of commercial equipment, there is not quite anything to exceed the thrill of switching on the h.t. of the home-brew receiver and hearing that DX signal come in at S9 plus, or the equally glorious sight of the plate meter of the transmitter dipping to plus zero current before loading the "skywire". There is that inexplicable feeling and sense of grandeur of having created something that really works. We cannot do better than enjoin all newcomers to the Amateur ranks to pursue the old tradition in some small way and experience that sense of achievement which must be kept alive if we are to continue to call ourselves Amateurs.

FEDERAL EXECUTIVE, W.I.A.

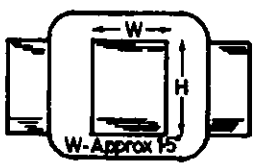
CONTENTS

RE-WINDING TRANSFORMERS

*IAN PHILLIPS**

PASSING examinations and being an Amateur are not good bedmates and when coupled with "student pauperism" some of the problems appear insuperable. Here is my answer to one insuperable problem, 300 volts at 500 mA. by re-winding burnt-out television power transformers. It cost me ten shillings for the purchase of the transformer and no more. The voltage doubler is almost unbeatable costwise (with re-winds) when coupled to silicon diodes, and it is on this basis these notes are formulated.

Fig. 1.

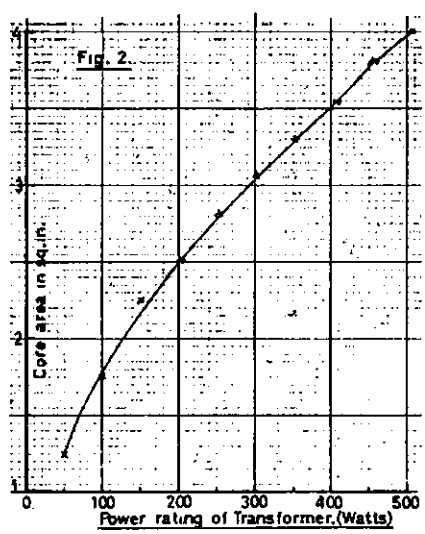


Often these transformers are to be had for the asking, or for a nominal fee. If you get the choice, take the largest one, or the heaviest one, as it will take more turns and handle more power than the smaller ones. In determining the amount of power it will handle, determine the core area, see Fig. 1, by multiplying 1.5[1] by the stack height and relate this to Fig. 2 to find its power handling capacity. Trying to take more will result in large losses and heating.

TAKING IT APART

When removing the cover plates take care with the leads as they may break off. Undo the bolts and put them somewhere where they won't get lost. Don't worry about the transformer falling to pieces, it won't. Then insert a knife between the top two laminations to break the "goo" holding them and pull out using pliers. Take care not to bend them. Continue this until they are all out and put them away so that they will not get damaged.

Fig. 2.



Now the order of the windings and which is the damaged one must be determined. An ohm-meter is useful for this and typical readings are shown in Fig. 3. Tag them or otherwise identify the layers to save trouble later. The usual order of winding is, from the core out: primary, high tension and heaters.

Fig. 3.

The winding that usually burns out is the high tension winding, and this can be seen by the layers of burnt paper. Try pulling on one of the burnt leads and wind the wire so obtained on to a spool. It may break and drastic surgery will be required to retrieve it. After a few layers of wire have been removed it should be possible to separate the primary and high tension wire from the outer windings and this should be done. Continue unwinding until all of the damaged winding is removed and carefully wound up. Then examine the primary to see if it also requires maintenance, it probably won't, but if it does follow the same procedure as for the h.t. winding, including the number of turns required.

TURNS PER VOLT

Now take the outer windings and remove the protective paper. Several windings in heavy wire will be visible. These are the heater windings and you can use them to determine the turns per volt (t.p.v.) ratio. Carefully count the number of turns on one of these windings and record it. If it is a multiple of five, it is a 5-volt winding; of six, it is a 6-volt winding. Commonly the number of turns will be 10 or 12, but if you find 20 or 24, check again to see if the manufacturer has put two wires in parallel as is often done. If there are 10 or 12 turns, the t.p.v. ratio is 2; 15 or 18, 3, etc. A common ratio is 2 t.p.v.

This leads to the number of turns that must now be put on the secondary. If the t.p.v. ratio is 2, then we require 2 turns for every volt, thus for 150 volts you need 300 turns, and for 200 volts, 400 turns, etc.

Gauge B. & S.	Current Capacity (Amp.*)	Turns per inch (Enamel)	Feet per lb. (Bare)
18	2.36	23.6	200
20	1.46	29.4	320
22	0.918	37.0	510
24	0.577	46.3	810
26	0.363	58.0	1300
28	0.228	72.7	2060
30	0.144	90.5	3280
32	0.090	113.0	5227

* May be increased 40%.

Table 1.

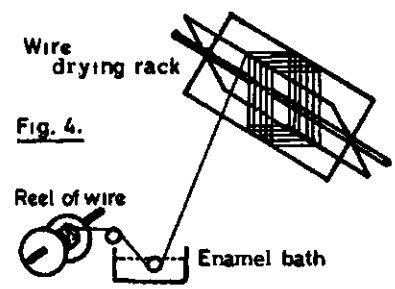
WIRE TO BE USED

The gauge of the wire to be used is determined by the current required (see Table 1).

If you are lucky the salvaged h.t. winding will carry the current, either single or doubled. To find its gauge, compare it with known wires, or use a micrometer. If it will take the current, then you must start thinking about re-insulating it as the enamel may be badly burnt. If so, it must be enamelled, if not it can be used as is. The chance of a small bare patch coming against another can be insured against by treating as a joint.

First the burnt enamel should be scraped off by running the wire through a steel-wool pad, taking care not to kink it. It must then be run through a bath of thin enamel, allowed to dry and run through again. See Fig. 4 for a suggested method, although many others will suggest themselves.

Fig. 4.



If you were unlucky and new wire has to be bought, the amount needed must be calculated. Measure the length of one turn around the primary and of one just inside the outer-winding, take an average and multiply by the number of turns required. This is the absolute minimum of wire required, so buy more.

Example, around the core, 10 inches; inside outer-winding, 16 inches,

Average = (10 + 16) ÷ 2
= 13 inches.

Inches required = 13 × 300 turns
= 3900 inches.

Feet required = 325 feet.

Now consult Table 1 for the weight of wire needed. Don't forget, if the wire is to be doubled, double the length.

Inter-layer insulation is waxed lunch wrap and a supply should be cut up beforehand. When winding, go as near as possible to the edge in order to put the maximum number of turns on each layer. In my case I used No. 26 re-painted wire doubled and managed 46 turns on the first layer and about 38

* 179 Abbot St., Sandringham, S.8, Victoria.

[1] This is an often used width for the core, but if you can determine the exact width, so much the better.

on the last. This was because of caution about going over close to the edges and was about the best possible.

Wind the wire on tightly, taping it slowly and note down the number of turns on each layer as each is completed, as to forget how many are on, is very trying to the patience.

After each layer is complete, place a strip of lunch-wrap over it and hold it in place with scotch tape. Wind all turns in the same direction (this is important).

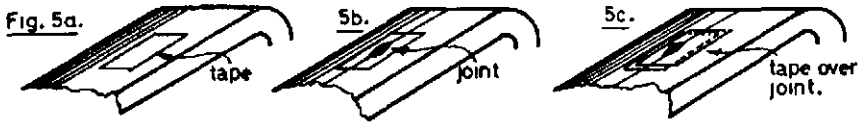
The high voltage winding is the toughest job and will take a couple of hours. If so desired, taps could be brought out so that a choice of secondary voltages is available and it is suggested that this is done on the edges of the layers to avoid complications. If the wire breaks, don't panic but carefully solder it up and put the joint into an insulated package as shown in Fig. 5.

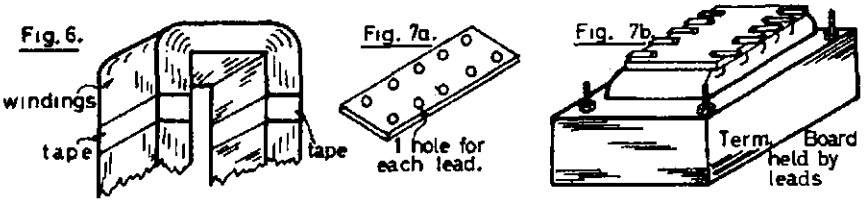
When the winding is complete wrap several layers of waxed paper around it for mechanical protection, then fit it back inside the outer windings and fix with several pieces of scotch tape (see Fig. 6).

RE-ASSEMBLING

Now the laminations have to be assembled and it is rather simple, just put one E-plate in from one side and one from the other, with the I-plates filling the gaps so left. Probably they won't all go back without extreme force, but don't worry, this small amount of iron will make no difference and to force them in will only damage the windings.

Put the bolts back in and tighten them up, leaving the cover plates off and the leads flying. Now it must be tested.





TESTING

To test, apply 6.3 volts from another transformer to one of the heater windings. If all voltages appear normal, then remove the 6.3v. and apply 240v. to the primary (use a fuse) and measure the voltages.

Turn off, pick up and drop the transformer about half an inch and repeat the tests. This is to check for intermittent faults. If all is still normal, apply power for two hours and check from time to time for excessive heating. It will warm a bit through losses, but should not get hot. If this is OK, check the voltages again and if all is as it should be, final assembly may be done. If not—heartbreak—it will have to be dismantled and thoroughly checked.

Replace one of the cover-plates and bolt it up tight and prepare a terminal board as is shown in Fig. 7a and attach as shown in Fig. 7b.

Thus you should have tailor-made volts and a knowledge of how to roll-your-own for almost nothing.

NOTE

Care should be taken when selecting the layer insulating paper, as some lunch wrapping papers soften with heat and could allow the tightly wound wire to cut through to the next layer, with consequent possible shorted turns.

Likewise some "sticky" tapes are hydroscopic, which can cause corrosion of winding wire if moisture is absorbed. This will result in open circuited turns, and more heartbreaks.

The above is not just academic interest, unfortunately, but the result of hard experience.—Editor.

DRIVING ZERO-BIAS 807s—VK4ZJB METHOD

J. D. BISGROVE, VK4ZJB*

UPON reading a previous article on this subject in "A.R." I was tempted to try methods myself. The results of this experiment have left nothing to be desired.

With the advent of t.v., several tubes capable of large audio power outputs have become available. Of these, the 6CM5 is very good in single ended or push pull work. Its plate impedance is 3,500 ohms normally, which is reasonably low and this is a desirable condition. With 300 volts anode and 150 volts (**maximum**) screen, you can secure at least 8, and up to 12, watts of audio. This is a good figure to drive 807s in zero bias.

The grid-to-grid impedance of zero bias 807s is 14,500 ohms. A 522 mod. tranny, originally used with push-pull 12A6s, has an impedance ratio of 22,000 ohms p./p. to 5,000 ohms, used back-to-front, i.e. with 6CM5 plate fed through the 5,000 ohms secondary (which is now used as the primary). The 3,500 ohms plate impedance of the 6CM5 reflects 15,400 ohms into the 807 grids—very close to 14,500 ohms and quite useable.

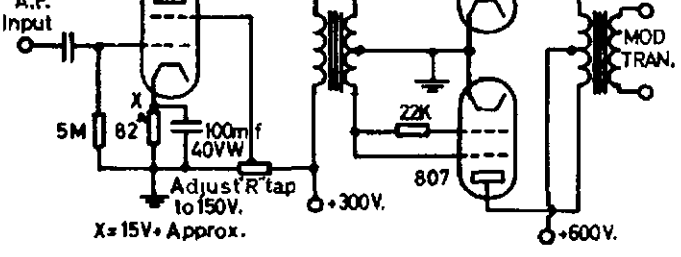
The modulator shown produces 100 watts of clean audio (r.m.s. value) into the 2,500 ohm load, which my transmitter presents.

At no time is the ex-SCR522 mod. transformer over-rated, in fact the primary (now), which was the secondary, previously handled more current than now. These transformers are easy to obtain and 6CM5s are cheap and loaf along here.

The amount of drive obtainable is adequate, in fact excess is available. A cheap and very effective 100 watts, and an easy answer to an old problem.

Although I tried triode connecting the 6CM5, and also negative feedback, I found that the 6CM5 behaves excellently as shown. Its low plate impedance is the good factor enabling such an effective and simple driver. ●

* 26 Kennedy St., Sandgate North, Brisbane, Queensland.



The Institute Badge may be purchased from your Divisional Secretary.

Five Half-Waves in Phase on 144 Mc.*

A GAIN ANTENNA FOR TWO METRES

BYRON H. KRETZMAN, W2JTP

● On two metre mobile and f.m., the vertical antenna still holds the edge on popularity with its omnidirectional characteristics and simplicity. Add to this, though, a little omnidirectional gain on the order of 5 db. and the vertical begins to look even more enticing than ever.

IN case you didn't know it, not all 2 metre activity consists of DX-chasing, meteor scatter, contests, etc. In many areas, I'll grant you metropolitan and suburban for the most part, local and extended-local communication exists on a highly reliable day-in and day-out basis. Mobile operation, quite naturally, is a regular part of this activity. This harkens back to the days of the old 5 metre band where such v.h.f. operation began. As the result, Hamming in these areas becomes a much more personal thing; everyone soon gets to know everyone else. It becomes easy to round up a gang to help put up a tower or a beam for another band.

Keeping in mind that working mobiles is a requirement, you can see that vertical polarisation is a must. Secondly, those who have tried beams quickly realise that, in these centres of high activity, beams are impractical. Too much can be missed off the back end. An omnidirectional antenna characteristic therefore becomes an additional requirement.

Omnidirectional antennae for 2 metres usually fall into two classes: the ground-plane or the coaxial-type. Both of these normally provide no gain in performance over a reference half-wave doublet, with the possible exception of the stacked coax antenna. What we are searching for is a 2 metre antenna which is vertically polarised and which will give us a power gain in all directions. Bear in mind, too, any gain achieved in the antenna system also results in increased range of reception. And, lastly, a high gain omnidirectional vertically polarised 2 metre antenna should be easy to construct at low cost. (This lets out the stacked coax unless you have the facilities of a machine shop available.)

THEORY

Gain in an omnidirectional vertically polarised v.h.f. antenna is realised basically by stacking half-wave elements, one above the other. The trick is to phase them properly and to feed them efficiently. This is nothing new. Twenty-five years ago this was called the "Franklin" antenna. Today a somewhat similar antenna is described in the A.R.R.L. Handbook.

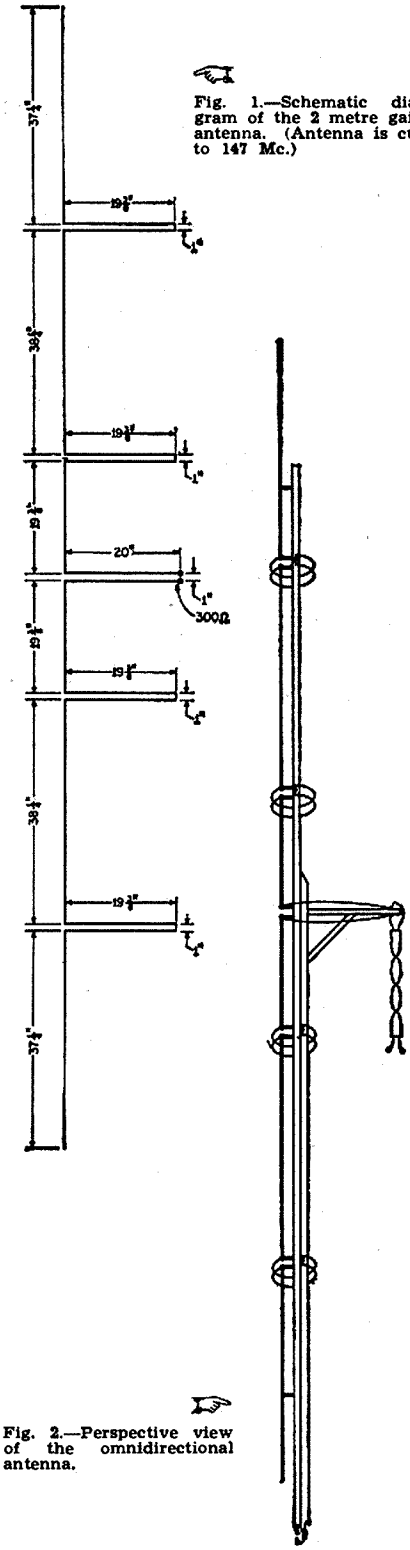


Fig. 1.—Schematic diagram of the 2 metre gain antenna. (Antenna is cut to 147 Mc.)

Fig. 2.—Perspective view of the omnidirectional antenna.

From page 703 of the 4th edition of "Reference Data for Radio Engineers" (I.T.T.), the gain of an omnidirectional stacked array is approximately equal to $2L/\lambda$ over the theoretical isotropic radiator, where L is the length. If we build an antenna of five half-waves in phase, the length, in terms of wavelength, is 2.5λ. Putting this into the above formula, the power gain is then 2(2.5) or five times. Since a half-wave dipole is considered to have a gain of 1.64 times the isotropic radiator, the antenna will therefore have a power gain of 5/1.64 or 3.05. This, then, is an effective gain of 4.84 db.

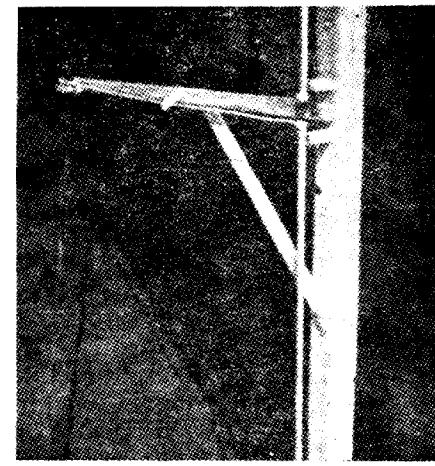
A PRACTICAL ANTENNA

Fig. 1 shows the schematic diagram of our 2 metre "gain" antenna. As you can see, it consists of five half-waves in phase, one above the other. There are quarter-wave matching stubs in between each element, and the feed point is at the centre of the middle half-wave element. (Feeding this array in such a balanced manner is one of the tricks in getting efficient operation.) The antenna feeder is ordinary 300-ohm t.v. "twin-lead". (Horrors!?) This was done for several reasons. First of all it is low cost, as compared to coax. Secondly, its losses are less than ordinary coax; and, thirdly, because it is a mechanically simple balanced transmission line with readily available inexpensive (t.v.) supporting hardware.

Our antenna was cut to about 147 Mc., and like any co-linear array it is reasonably broad, having a low s.w.r. out to at least 1 Mc. either side of that frequency.

You could feed this antenna in the centre of the middle element directly with the 300-ohm twin-lead, that is if

(Continued on next page)



Centre feed arrangement showing how the linear matching transformer is twisted to enable the twin-lead feeder to drop straight down.

* Reprinted from "CQ," March 1964.

you don't mind a standing wave ratio of about 2 : 1. We did, so a quarter-wave linear matching transformer was installed at the feed point. The results were extremely gratifying. Its installation brought the s.w.r. down to 1.1 : 1.

Just one more point: Note that. in the interest of balance, the matching transformer is brought away from the feed point at a right angle; and, consequently, the twin-lead feeder is brought down at least a quarter-wave from the lower sections of the antenna thereby little affecting the feed impedance.

CONSTRUCTION

Our 2 metre gain antenna is built on wood. (Horrors, again?) Using wood greatly simplifies construction and reduces cost. You can't buy 2 x 2's twenty-four feet long, but you can buy a 2 x 4 that long. Just a little sweet-talkin' to the lumber yard man and he will rip-saw it right down the middle for you. Of course you should get him to let you pick out a length as straight-grained and as free from knots as possible. Total cost? Less than $3!

Ater you get your lumber home, select the half most free from knots for the top section. A few minutes work with a carpenter's plane on the corners will save you from splinters while you are handling the antenna. It's time well spent. The remaining half we sawed in two to make the bottom of the classical "A" frame of hamdom. You could gain another 12 feet or so of height if you were to splurge and buy another (ripped) 2 x 4. We didn't.

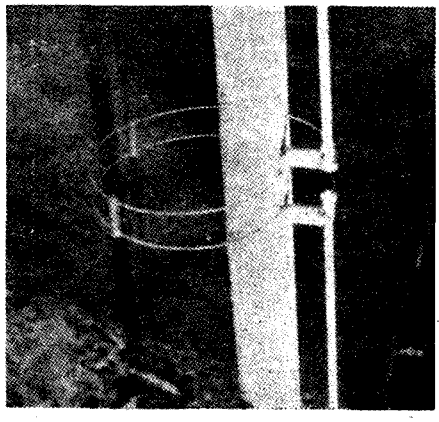
The antenna elements themselves we recommend be made of aluminium to keep down the weight. We found some 3/16" solid rod in surplus, but almost any kind of aluminium rod or tubing up to about 3/8" in diameter can be used. Old discarded t.v. antenna elements, for instance. Another good possibility is No. 8 or 10 aluminium clothes line wire. (This hard-drawn wire is stiff compared to the bare aluminium "ground wire" sold in t.v. parts stores.) Since we used the relatively stiff solid rod, only two ceramic one-inch high stand-off insulators were used with each element. The element was fastened to each insulator with nylon cable clamps, available in parts stores for pennies.

No doubt you have noticed that the quarter-wave matching stubs between each element have been curved around and have had their "shorting bars" screwed down directly to the wood mast. (Horrors, thrice!?) Well, curving around these stubs makes the whole array lots easier to handle than if they were sticking straight out. No difference in performance was discernible when they were curved back, by the way.

The actual stubs were made of a continuous piece of No. 14 wire, so there were no mechanical problems with a "shorting bar". Spacing was 1", and three spreaders made from ¼" diameter plastic rod were slipped on the wires. The squared-off "shorting-bar" end was directly screwed down to the wood mast since this is "cold" in so far as r.f. is concerned. This resulted in a fairly sturdy halo about 6" in diameter.

The quarter-wave linear matching transformer at the feed point is much simpler to construct than to describe. This "Q-bar" section, 20" long, is made from No. 8 aluminium ground wire spaced at 1". One spreader was installed in the middle. To facilitate the dropping-down of the twin lead feeder, this matching section is given a 90° twist so that the junction point of the section and the twin-lead is horizontal. This junction point terminates on a square bakelite block screwed to the braced strip of wood used to bring the feed point out at right angles to the antenna.

To forestall any possible electrolysis problems and to prevent any loosening of hardware which might be caused by wind vibration, we brushed coil dope on each screw, bolt, and nut, and on the spreaders on the matching stubs. This is real good insurance.



One of the four quarter-wave matching stubs. Note how it is curved around into a halo about 6 inches in diameter.

GUYING

Wire guys should come no closer than a quarter-wave (about 20") from the end of the bottom element. This leaves about 15 feet of the mast free to whip around slightly in the breeze. If you live in a windy part of the country you should add an additional set of nylon guys, fastened about at the centre matching transformer. Ordinary nylon fishing line is very good for this purpose.

PERFORMANCE

We installed our 2 metre "gain" antenna about 20 feet from our "reference" dipole and about the same height. The reference antenna was fed with about 85 feet of foam-type RG-8/U coaxial cable. The antenna was fed with about the same length of cheap 300-ohm t.v. twin-lead. A coaxial balun, used to transform the balanced line to the unbalanced coax input of the transmitter was installed right at the transmitter. A Knight-Kit P-2 bridge was installed between the balun and the transmitter. The s.w.r. on the reference antenna was 1.5 to 1. On the gain antenna it was 1.1 to 1. About a 2-to-1 increase in signal strength of stations received was noted. Stations worked immediately noted the increase in our signal. Mobiles especially could now be worked out to much greater distances.

All in all, the week-end we used to put together this antenna was well worthwhile. Since initial tests the wood mast has been lashed to the top of a tree, elements above the tree tops, at a height of about 90 feet. The feeder length is now about 125 feet. Mobiles (f.m.) operating on eastern Long Island have been reliably worked out to distances of 30 to 40 miles. And we run only 60 watts input. ●

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

A GUIDE TO IMPROVING V.H.F. PERFORMANCE

DAVID D. TANNER, VK3AAU*

THIS article is an effort to demonstrate a way of using limited resources to work over longer distances, and to show what effect various improvements will have on the range over which we can reliably work. Particular reference is made to two metres, but most of the points discussed are applicable to other v.h.f. bands as well. There are several factors which limit the distance over which we can normally communicate, these can be summarised as follows:—

(a) Transmitted power,
(b) Receiver sensitivity,
(c) Antenna gain,
(d) Path characteristics.

Transmitted power is relatively simple. It depends on our input power, the efficiency of the final, and to a large extent on the loss in the feedline. This latter is one which has been the subject of a lot of discussion.[1,2] The choice of feedline depends to a large extent on what you are prepared to pay, but particularly where long runs are necessary, the best value for a limited amount of money seems to be formula III. open-wire t.v. feedline. Care must be taken in its installation to keep it free from sharp bends and to keep it away from metal objects. It should also be kept strained as tightly as possible. All these requirements limit its flexibility somewhat, but they are absolutely necessary to make the most of its low-loss characteristics.

Next we come to coaxial cables, many of which are not worth buying. The best of the disposals ones seems to be UR/67 with RG-8A/U a close second if you can get it. The older type RG-8/U is not recommended as it deteriorates in the weather with an increase in losses. Thin types should be avoided, particularly in the construction of baluns. 300 ohm ribbon is not recommended as it is a poor performer when wet. Feedlines should be operated with as low a s.w.r. as possible, preferably below about two to one.

The next item on the list is receiver sensitivity, and this is where a lot of newcomers to v.h.f. have the greatest difficulty. A typical example of an insensitive receiver is the ubiquitous SCR522. It falls down in most departments when compared with the crystal locked converter-communications receiver combination used by most advanced stations.

First, the SCR522 has a poor noise figure because of its pentode front end. This can be improved by adding a preamplifier using one of the modern 6CW4 nuvistors[3] or a hot t.v. tube such as a 6ES8. Its second fault is its wide bandwidth due to the use of a 12 Mc. i.f. channel. The usual method used to make these receivers cover the two metre band is to disable the crystal injection chain and make the last multiplier stage into a tunable oscillator at approximately 132 Mc. As this oscillator is generally not very stable, a comparably broad i.f. is needed to hold the signals within it. A better approach is to leave the crystal chain operating and to use a second conversion stage to 455 kc., using a tunable oscillator on about 11.5 Mc. The 12 Mc. i.f. can then be stagger tuned and possibly resistive loading added to make it about one megacycle wide so that for full coverage of the band the four crystal positions would be used. In this way as much selectivity as you like can be built into the i.f. and the receiver can be used to copy c.w. and s.s.b., the advantages of which will now be discussed.

A.m. phone requires a signal to be about 7 db. above the noise in a bandwidth of 6 kc. S.s.b. only needs to be about 3 db. above the noise to be readable and the bandwidth can be reduced to as low as 2 kc. This is a gain of nearly 9 db. over a.m. C.w. can be read with a 0 db. signal to noise ratio and the effective bandwidth of the ear with a 1 kc. beat note is of the order of 500 cycles. This is well worth considering when path losses are taken into account.

Another important part of the installation is the antenna system.[2] This, in common with the feedline, is part of both the transmitting and receiving circuits, and so is also quite important. For effective v.h.f. performance, antenna height is important, and as a rough rule, doubling the height of an antenna will increase signals by 3 to 4 db. A 12 foot yagi is about the equivalent of a 12 element phased array, although the latter will work over a wider band. A well designed yagi of one particular length is 3 db. better than one of half that length. Yagis should be stacked at least two-thirds of their length apart, preferably more for short ones.

Lastly, we come to the problem of path characteristics.[4] This is something over which we have no control, although an appreciation of the factors involved enables us to predict the results which will be obtained when we make any improvements to our equipment.

Assuming smooth earth, we find that a path loss of about 156 db. exists at a distance of 25 miles between two antennae at a height of 30 feet. This increases to a value of 175 db. at 50 miles, 195 db. at 100 miles, 201 db. at 200 miles, and 214 db. at 300 miles. Using these figures, let us consider the performance of two stations using virtually unmodified SCR522 equipment with 12-foot yagis, 30 feet high.

Transmitter output power, 8 watts.
Receiver noise figure, 10 db.
Receiver bandwidth, 50 kc.
Feedline 50 ft. RG-8A/U 1 db. loss.

This results in a 7 db. signal above the noise at a distance of 45 miles. Addition of a 6CW4 preamplifier and converting to a bandwidth of 6 kc. will increase the range to 75 miles, and the use of c.w. with this set-up is effective up to 250 miles.

Now compare these figures with two stations using 3 db. N/F converters into narrow band communications receivers, with 150-watt transmitters and 18 db. antennae, 50 feet high. Using a.m. they can work one another at a distance of 310 miles, and this can be increased to 370 miles with s.s.b. and 420 miles with c.w.

Naturally, these figures will be modified in practical circumstances by the presence of hills[5] and temperature inversion effects, but in general they will be found to be quite reliable. The nightly contacts between VK5ZDR and VK3NN are a good example of this.

REFERENCES

The following references to "QST" will be helpful in amplifying most of the points made above:—

1. Ferber, "Coaxial Cable Attenuation," "QST," April 1959.
2. Tilton, "V.h.f. Antenna Facts and Fallacies," "QST," Jan., Feb. and Mar. 1964.
3. Bohmer, "Grounded Grid Nuvistor Preamplifiers," "QST," May 1963.
4. Bray, "A Method for Determining V.h.f. Station Capabilities," "QST," Nov. 1961.
5. Craig, "Obstacle Gain Techniques for 50 Mc. and Higher," "QST," Mar. 1958.

Most of these are obtainable through the W.I.A. libraries and the Editor may possibly be coerced into reprinting some of them if sufficient interest is shown. ●

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK5MS	24	306	VK2JZ	61	216
VK6RU	2	303	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6MK	43	293	VK3ATN	26	204
VK3AHO	51	288	VK4HR	12	192
VK4FJ	21	280	VK4RW	23	186

C.W.

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK3KB	10	325	VK6RU	18	260
VK3CX	26	303	VK3AHQ	79	245
VK2QL	5	301	VK3ARX	66	242
VK4FJ	29	296	VK3XB	75	238
VK3NC	19	286	VK3YL	39	231
VK2AGH	71	262	VK2EO	2	230

Amendment:
VK3AX 68 146

OPEN

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK6RU	8	309	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	296	VK7LZ	23	242
VK6MK	74	295	VK4HR	7	233
VK3AHO	76	292	VK2VN	18	233

* Lye and Dixon Rd., Ripplebrook, via Drouin, Victoria.

Practical Designs for . . .

HIGH STABILITY VARIABLE FREQUENCY OSCILLATORS*

Part One—Considerations Affecting Performance and Survey of Types

PAUL HARRIS, G3GFN

THE performance of modern variable frequency transmitters is, in no small way, dependent on the inherent stability of the initial frequency control oscillator. Ideally a variable frequency master oscillator should possess the following principal features:

(a) Have a short preliminary temperature/time stabilising period;
(b) Maintain its calibration to a high order of accuracy over reasonable temperature excursions;
(c) Retain its initial calibration closely after replacing valves;
(d) Be acceptably insensitive to nominal variations in both h.t. and l.t. voltages;
(e) Give high output;
(f) Have low harmonic content; and
(g) Key well.

While the foregoing features may appear obvious, nevertheless, detailed examination of them when related to design and practical considerations will be found worthwhile.

Insofar as the initial temperature/time stabilising period is concerned, even if the major frequency change does occur within a relatively short time from switching on, a v.f.o. which exhibits a continual and slow drift is unacceptable. In c.w. and s.s.b. operation, involving highly selective receivers or precise carrier reinsertion, such frequency shift is intolerable.

DEFINITION OF STABILITY

As all simple oscillators exhibit some drift, it is useful to define the amount which must not be exceeded when in the stable state. For Amateur purposes a v.f.o. may be considered to have stabilised when the frequency change rate does not exceed 15 parts in 10^6 per hour, i.e. 15 c.p.s. per Mc. per hour.

The layout and quality of components have a considerable bearing on the initial and long-term frequency shift of a variable frequency oscillator, and indeed it is enlightening to quantitatively assess the performance of two theoretically identical oscillators compounded from different quality components and constructed in alternative ways. However, at this stage we are not so concerned with drift attributable to components and layout, but rather, the inherent stability of a particular configuration. There are considerable differences between oscillator circuits in respect of the amount of the initial shift, stabilising period and long-term drift.

EFFECT OF CROSS-MODULATION

A particular effect, believed to be due to cross-modulation between the basic oscillator frequency and its harmonics, and the harmonics themselves, produces currents at the fundamental frequency which can be out of phase, and varying in phase angle with the original fundamental frequency currents. These currents tend to shift the frequency of oscillation, depending on their amplitude and phase, and it can be shown that, as excitation is reduced, the magnitude of these currents also decreases and, consequently, the drift also reduces.[1] It follows therefore that the lighter the coupling needed to sustain oscillation, then the higher the stability of the oscillator, particularly initially when changes within the valve will have less reflected effect on the frequency-determining circuits.

CLASSES OF OPERATION

Experiments have indicated that the class of operation of an oscillator has a direct bearing on the initial and long-term stability, and these experiments verify, to a large extent, the cross-modulation theory. The impulses —feedback—applied to the tuned circuit can be such that the feedback current ranges between less than 180° and 360° of the cycle. Depending on the period, the oscillator may be classed as "A," "B" or "C" but in all cases grid current flows for part of the input cycle. Class A oscillators have the lowest harmonic content, shortest stabilising period and excellent long-term characteristics. Class C oscillators on the other hand can exhibit considerable variations in respect of long and short-term stability, and, moreover, have high harmonic content.

CHANGES IN TEMPERATURE

In any apparatus there can be no guarantee that the internal temperature will remain constant over a given period of from day to day. Changes in ambient temperature coupled with variations in dissipated heat are bound to produce differences in internal temperature. It is essential therefore that the v.f.o. is able to accommodate variations above and below the mean level without undue frequency shift and resultant calibration error.

Aside from considerations of rapid stabilisation and long-term stability, it is important to evaluate the effect of changing the oscillator valve on calibration accuracy. Even if a compensating control is fitted it is tiresome to have to adjust this to restore calibration after replacing the oscillator valve. In general, circuits having tight coupling between valve and frequency determining components show the greatest shift. Perhaps a good example of this is the Pierce 100 kc. crystal controlled substandard. Changing the valve inevitably requires adjustment of the compensating control to secure zero beat against a Standard Frequency Transmission such as M.S.F.

VOLTAGE VARIATIONS

With the rapid short-term changes which can take place in mains voltages, not only is the h.t. likely to follow, but the heater supply as well. Highly accurate stabilisation is both expensive and complicated, but nominal stabilisation of the h.t. can be accomplished by relatively simple means through the use of a VR105/30 or VR150/30 or similar gas filled regulator valve. It is important therefore to evaluate the performance of a v.f.o. against variations in h.t. and heater voltage.

UNDESIRED OUTPUTS

At the present time, the transmitting Amateur is confronted with a formidable list of frequencies which must be avoided. By this is meant frequencies which are incidentally produced—harmonics—or inadvertently chosen—in multipliers—and which are likely to cause interference to other services. It is only too well known that television receivers are particularly prone to interference from Amateur transmitters, and, with the greatly increased sensitivities of modern receivers, the very wide bandwidth of front-end tuners, poor image rejection and high susceptibility to cross-modulation and blocking, harmonics and intermediate multiplier frequencies must have the closest attention. Much can be done by filtering and screening, but if the offending frequencies can be avoided, or at the very least substantially reduced, then so much the better. Many v.f.o. circuits are not only vigorous oscillators, but also, for reasons already discussed, produce a string of potent harmonics. Such oscillators should be avoided.

The price of using a v.f.o. with a low harmonic content is that the frequency multipliers must operate efficiently in their chosen mode having the stipulated drive, element voltages and tank circuit Q. Many so called multipliers rely to a fair extent on the harmonic content of the drive to produce the required output and are not inherently efficient multiplier circuits as such. While the factors affecting multipliers are not pertinent to this paper, suffice it to say that certain valves are more suitable than others for this type of service, but many other types can, under suitable conditions, provide satisfactory performance. Whenever possible reference should be made to the valve manufacturers' application report on the type being considered.

KEYING

While it is accepted as bad practice to key any v.f.o. directly, under certain conditions—such as BK keying for

* Reprinted from R.S.G.B. "Bulletin," Feb. 1964.

[1] "Theory and Design of Valve Oscillators," H. A. Thomas. Chapman and Hall, London.

example—it is desirable to d.c. switch the oscillator in some manner, unless frequency shift keying is incorporated. If there is a frequency change during the initial current flow within the oscillator circuit, then this will give rise to chirp. An oscillator which meets all other requirements may well show chirp when d.c. switched. Care must be taken when assessing chirp as r.f. circulating currents due to badly disposed earth points, or reactive decoupling capacitors can produce this effect. Nevertheless different oscillator configurations have their own individual chirp characteristics.

OUTPUT CAPACITY

Finally, a variable frequency oscillator should have a high output capability, always provided that this is not at the expense of other more desirable features, especially in respect of harmonic content. The object of having a high output from the v.f.o. is not simply to use all this output and trim down on the following stages, but rather to be able to load the v.f.o. lightly and so work it well within its power capabilities. Heavily loaded v.f.o's. always show frequency shift as the subsequent stages of the transmitter are tuned up, or as the transmitter is loaded. The frequency differences which occur between stations, allegedly on the same channel, are usually due to pulling of the v.f.o. frequency due to loading effects, rather than inaccurate "netting".

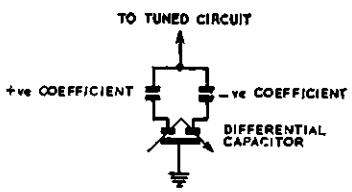


Fig. 1.—Temperature compensating circuit employed in Hallicrafters HT32 transmitter v.f.o.

CHOICE OF COMPONENTS

Having dealt at some length with the main features expected of a v.f.o. circuit, and, inter alia, the reasons for them, it now seems prudent to examine the requirements in respect of components.

No matter how excellent the probable performance of any v.f.o. circuit, stability and drift are still at the mercy of the components employed, not so much in terms of their initial values —which can always be adjusted—but rather in respect of the actual **stability** of the components themselves and their ability to retain their original values through temperature excursions. Often negative coefficient capacitors are employed to compensate for changes which occur in values of frequency determining components due to heat. While it is acknowledged that, correctly applied, this can be highly satisfactory, it should be kept in mind that, in theory, perfect compensation can only be achieved at one specific frequency, and the greater the amount of compensation applied, the more frequency selective it will become. The usual problem encountered is that the exact value of negative coefficient capacitor is not available, or the one that is has an incorrect temperature/capacity gradient. Under these circumstances the final result is a compromise between perfection and minimum obtainable drift. Hallicrafters have solved this problem very neatly in their HT32 s.s.b. transmitter. In this circuit, which is shown in Fig. 1, a differential capacitor is used in such a manner that varying the differential varies the amount of correction "seen" by the tuned circuit. With this arrangement practically perfect temperature compensation can be achieved.

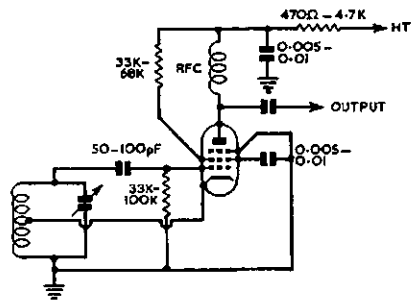


Fig. 2.—Basic electron-coupled Hartley oscillator.

For most Amateur purposes, high quality components, attention to mechanical stability and component layout can, with a suitable circuit, produce an oscillator which is satisfactory even under critical operating conditions.

With regard to the frequency determining circuit in particular, the coil should be wound under as much tension as the gauge of the wire will allow, taking care when working with fine gauges not to stretch the wire. High grade non-porous formers are essential, and when winding has been completed and adjusted, it should be heavily doped. The use of a former having an iron dust core has much to commend it, as not only are inductance variations simply made by adjustment of the core, but also the physical size of the coil can be reduced. Caution is required in circuits where ferrite cored coils are employed for, with high power, saturation may take place. However, this is unlikely in most circuits used in the low level stages of Amateur transmitters and certainly will not occur in any of the v.f.o. circuits to be described in detail.

Tuning capacitors should for preference be double spaced so that the effects of expansion, and consequent variation in capacity are held to a minimum. General mechanical rigidity is important, as is the method of securing connection to the rotor plates. The quality of the insulation supporting the fixed vanes must be absolutely above reproach as otherwise the tuned circuit may well contain an unstable element.

The resistor which acts as the grid leak is normally effectively in parallel with the tuned circuit, or at least one element of the tuned circuit. For this reason it requires as much care in its selection as do the frequency determining components themselves. Not only must it be highly stable in its d.c. resistance, but also in respect of any self capacity or inductance. It should be well overrated in terms of wattage so that any changes which do take place are as result of environment—which can be controlled—rather than the actual current flow through it.

The valveholder requires special attention. Only first grade insulate mouldings with silver plated contacts should be used.

In considering the foregoing comments, it should be borne in mind that we are concerned with **highly stable** oscillators. Much licence can be, and often is, taken where the application is not critical, the frequency low, or automatic frequency correction circuits employed.

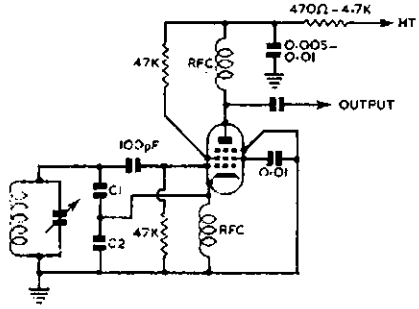


Fig. 3.— Basic electron-coupled Colpitts oscillator.

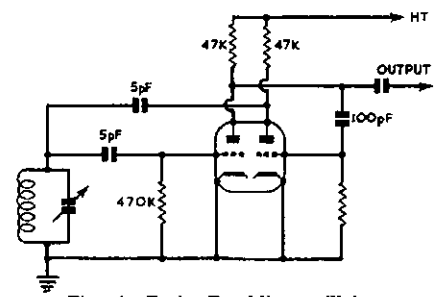


Fig. 4.—Basic Franklin oscillator.

Comments which apply to transmitter master oscillators are equally applicable to receiver local oscillators, and for that matter to secondary injection oscillators such as b.f.o's. and carrier reinsertion oscillators. Despite the general advance in receiver design, only in the Racal RA17, Drake 2B and Collins 75A does any serious attempt seem to have been made to match local oscillator performance to other improvements. All too often "domestic" type receiver oscillators are still to be found. In fairness to other manufacturers, there does now seem to be an awareness that these departments have been too long without attention. The increasing use of s.s.b. has undoubtedly shown the very real need for this revision in view of its particularly high demand on stability.

SURVEY OF TYPES

In the immediate post-war period, v.f.o. circuits were usually of the Hartley (Fig. 2), Colpitts (Fig. 3) or Franklin (Fig. 4) types. With care and attention both the Hartley and Colpitts could be made sufficiently stable for the receivers in use at that time, but invariably they required considerable individual treatment. Some were excellent, some were passable, but others could claim no polite label. All tended to be fussy as they ran in modes varying between class B and class C with tight coupling between valve and tuned

circuit. They were excellent for multi-band transmitters as their output contained substantially high levels of close order harmonics. This particular attribute proved to be disaster to many Amateur stations as television spread throughout the country.

Of the three oscillator types mentioned, the Franklin has an inherently high stability characteristic, but as this oscillator requires either two triodes, or a twin valve, and has low output, it did not find the favour which it deserved. In respect of this oscillator, it is interesting to note that one manufacturer is employing it in a receiver of advanced design.

In the late 1940s the Clapp oscillator (Fig. 5) came to the attention of the Radio Amateur and received great acclaim.

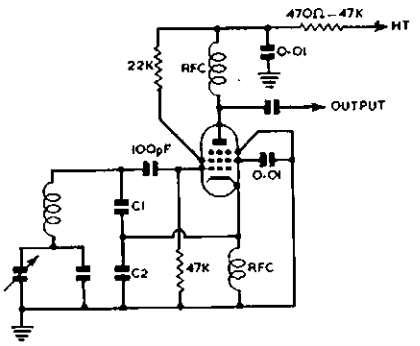


Fig. 5.—Basic Clapp oscillator.

The Clapp oscillator—originally developed by G. G. Gouriet, of the B.B.C. represented a major advance in variable frequency oscillator design as it substantially divorced valve capacities, and changes therein, from the frequency determining circuit, and in so doing, removed the major cause of frequency drift.

There is a family resemblance between the Clapp and Colpitts oscillators as examination of Figs. 3 and 1 will show. In the Clapp oscillator the frequency control circuit is arranged for series tuning, and as a result C1 and C2 form part of this circuit as well as being a capacity divider for feedback purposes. In the Colpitts configuration, C1 and C2 are in no way associated with the tuned circuit but are a capacity divider pure and simple, other than from the point of view that the effective capacity of C1 and C2 in series is in parallel with the tuned circuit. In the Clapp oscillator, high values at C1 and C2 effectively swamp valve capacities so that any changes therein are very small with respect to these capacitors.

While achieving a high order of stability the Clapp oscillator has two disadvantages. First, the output drops rapidly if worked over a frequency range in excess of about 1.2 : 1. Second, while the Clapp can be designed to work at frequencies in excess of 10 Mc., as the frequency increases, the values of C1 and C2 decrease rather rapidly with the result that they no longer effectively swamp valve capacities, and so the principal advantage of this configuration becomes lost.

The Clapp oscillator was the subject of further development by Vackar of the Tesla organisation with results that do not appear to have been appreciated in the same way as was the original Clapp design. This development was reported in the "Bulletin" in some detail.[2] What Vackar did to the Clapp very nearly equals what Gouriet did to the Colpitts. The result is an oscillator that fulfils almost perfectly the requirements stipulated in the second paragraph of this paper.

The Vackar—sometimes called the Tesla—oscillator (Fig. 6) operates over a wide frequency range, 2.5 : 1, before there is any serious reduction in output, and over the range of 2 : 1 the output remains sensibly constant. Given due care and attention, the Vackar can be used on a fundamental frequency of 72 Mc. where it shows an order of stability which is quite outstanding.

[2] R.S.G.B. "Bulletin," March 1956.

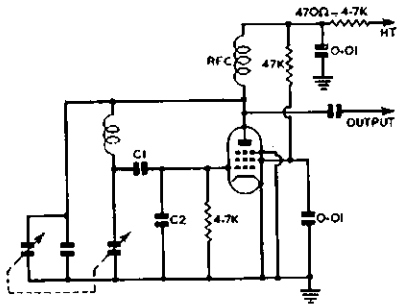


Fig. 6.—Basic Vackar/Tesla oscillator.

Although its output is high, harmonic content is low as it operates substantially in class A.

(To be continued)

THE "PHASER" FOR TWO METRES*

JOHN A. FREDRICKS, K7GGJ

● The author presents an easy-to-construct phase modulator that can be connected to any a.m. transmitter to achieve the same basic advantages found in frequency modulation. When the operator wishes to return to a.m., he simply turns down the gain control on the phase modulator!

Many v.h.f. Hams have at one time or another wanted to try their hand at v.h.f. p.m. operation. If you are one of these fellows, then take a look at this. First I would like to point out that this particular rig is not complete in itself as a transmitter, but is rather an adaptor that can be added to any 2 metre rig to permit p.m. operation without impairing other modes of operation.

Now let's get on to the diagram, as can be seen in Fig. 1. The crystal oscillator is nothing out of the ordinary. It is, in fact, a modified Pierce-type of oscillator. The triode half of the 6U8 is used as the phase modulator and deviation is set by the capacitor CN. Maximum deviation will be attained at maximum capacity. No attempt to multiply in frequency should be made in either the crystal oscillator or in the phase modulator, as frequency "swing" at the resultant output frequency will be down. Frequency multiplication should take place only after the phase modulator stage.

I don't believe that much has to be said about the audio section except that deviation is also controlled by the audio gain control and you may not have to build the stage at all. You may be able to steal the audio from the speech pre-amp. stage in the a.m. section of your rig. The reason that I built up the audio stage was so that I could go from p.m. to another mode of operation merely by turning down the gain control in the phase modulator unit.

In my 2 metre unit I simply removed the old crystal oscillator and built the p.m. unit in to the rig and now I utilise the p.m. osc. for all modes of operation. I would also like to point out that I did not include coil specs. because there will be some who will want to put this adaptor on 3 Mc., 6 Mc. and 8 Mc. to multiply to 2 metres and I also feel that anyone who constructs v.h.f. gear has the technical ability to come up with the appropriate coils.

The resistor divider network in the control grid of the triode half of the 6U8 is called an audio correction network and performs the following function: When a phase modulator is employed, the equivalent carrier frequency "swing" is in proportion to the amplitude of the audio signal. Rises in the audio signal frequency cause further undesired phase shift in the carrier. The unwanted rise in phase shift is removed by the use of an RC network to lower the amplitude of the audio signal in proportion to the frequency increase.

In this particular circuit a deviation of ±7 kc. was attainable with the trimmer CN at full capacity, and the audio gain control "wide-open". I have had this adaptor on for about three months with very good reports so get out the soldering iron and good luck on 2 metre p.m.! ●

* Reprinted from "CQ," October 1963.

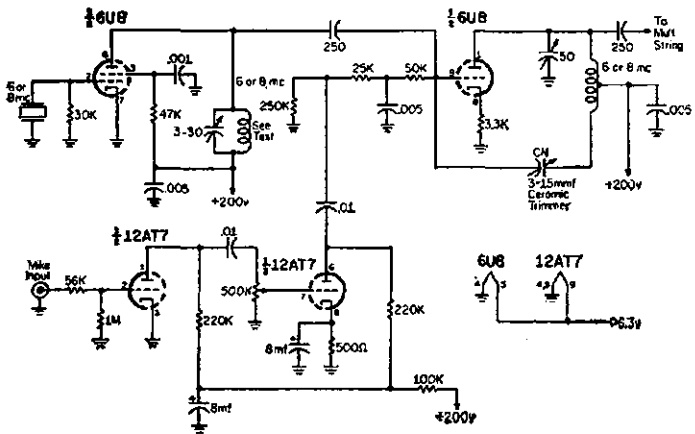


Fig. 1.—Schematic of the phase modulator as constructed by the author for 2 mx operation. Coil specifications are not included, as you may want to use this unit for other bands (see text). All resistors are ½ watt.

T.V. FREQUENCY CHANGES

The majority of television set owners would not be affected by the alteration in the frequency of the new national television channel to be opened in Townsville in September, the Postmaster-General, Mr. A. S. Hulme, said.

He said that a change in the frequency had been necessary in order that the Townsville station would not interfere with the Rockhampton station in the fringe area around Bowen.

The new frequency will be 87 megacycles for vision and 92.77 megacycles for sound.

He said that this should be within the range of fine tuning of the majority of television sets.

—Townsville Daily Bulletin, 9/7/64.

Publications Committee Reports . . .

Since the 13/7/64 to the 12/8/64 all inwards correspondence has been published in this issue of "A.R." except one technical article on a "Low Efficiency 80 Mx Transmitter" and a letter from VK4ZAZ.

In view of the poor quality wrapper previously being used on "AR.," it was decided to use a new style pre-printed type, even though the cost was greater. Readers are again reminded that if the mailing address shown on their "A.R." wrapper is incorrect they should notify their Divisional Secretary direct. Direct subscribers to "A.R." should write to P.O. Box 36, East Melbourne, C.2.

Negotiations with the P.M.G. having been completed it will be in order to proceed with the printing of the new Call Book, which should be available about October 1964.

The Committee accepted with great regret the resignation of Ron Higginbotham. VK3RN has given long and devoted service to the magazine and it was decided that henceforth the Editor's Award for the best technical article will be known as the "Higginbotham Award". This is the most fitting manner in which Ron's service to "Amateur Radio" will be perpetually honoured. Mr. K. Pincott has accepted the position of Assistant Editor.

CALLING ALL XYLs AND YLs

Some XYL operators have formed a small net on 80 metres. They are hoping that other XYL or YL operators will join in. At present the net is on about 3600 kc. on Thursday evenings at 2030K.

Interested XYLs can either break in on the net or contact Freda VK2SU or Brenda VK3KT who have skeds on 40 metres each Tuesday about 1400K.

Any non-licensed XYLs who can persuade the OM to operate the rig will be most welcome to the net.

AMATEUR FREQUENCIES:
ONLY THE STRONG GO ON—
SO SHOULD A LOT MORE
AMATEURS!

7th JAMBOREE-ON-THE-AIR

17th and 18th October, 1964, starting 10 a.m. Saturday

WORLDWIDE interest in this annual event is increasing every year as more and more Amateurs and Scouts become aware of the potential that both organisations can contribute to international understanding and goodwill.

Last year over 300 Amateur Radio Stations were placed at the disposal of Scout Groups throughout Australia.

The Boy Scouts Association is very conscious of the help and co-operation that is being given to the Scouts and their Leaders, and much goodwill and publicity is received by the Wireless Institute of Australia, both overseas and in Australia through the many magazines and other publications of the Boy Scouts Association.

Since we know there will be many for whom this 7th Jamboree-on-the-Air will be their first, we will repeat the rules hereunder.

OBJECTS

Firstly, the objects of the Jamboree-on-the-Air are as follows:—

To let Scouts talk or listen to their brother Scouts, whether they be in the next town or in another country, and to learn about their activities, families and homes.

To introduce them to Amateur Radio and Electronics.

RULES

The rules are as follows:—

1. License regulations must be strictly observed at all times.
2. Any part of the 48-hour period may be used.
3. Any authorised frequency may be used.
4. To take part, call CQ Jamboree or answer another station using this call.
5. You can use c.w., a.m., s.s.b., or any mode authorised.
6. This is not a contest. There are no prizes given for the most contacts made. A participation certificate will be sent to all Amateurs sending in a log sheet which will be provided by the Scout Group, or by sending a report to the Branch Organiser.

You will probably be approached by a member of the Boy Scouts Association, but if you are not and would like to help a local Scout Group, then write to your State organiser. The Victorian Branch Organiser is Mr. J. G. Nicholson (VK3AAN), 28 William Street, Glenroy, Vic.

ORIGIN OF JAMBOREE-ON-THE-AIR

During the Jubilee Jamboree at Sutton Coldfield in England in 1957, which was organised to commemorate the origin of Scouting some 50 years earlier, a number of Scout Radio Amateurs got together at the Radio Station there and held what they called a Hamfest. A suggestion was then made and enthusiastically adopted that Scouts should try to contact each other on a fixed date each year by means of Amateur Radio. Thus was born "Jamboree-on-the-Air".

The idea had a lot of merit, for although World Jamborees are held only every four years, the expense unfortunately precludes many Scouts from taking part, despite the fact that it is an experience that cannot be compared with any other Scouting activity —the experience of camping in a foreign country and meeting and making new friends from among the thousands of Scouts there from all parts of the world.

Those who attended the Sutton Coldfield meeting realised this and recognised that the answer lay, to some extent, that it was still possible for Scouts to meet and talk to each other without leaving their own towns. So that as a means of bringing home to the average Scout the true meaning of World Brotherhood, without any expense to the boy or his parents, the scheme could not be bettered.

So in 1958, over the week-end of 10th and 11th May, the first Jamboree-on-the-Air was held, with Leslie R. Mitchell of England, an ex-A.S.M. of the Boy Scouts of America, and himself an enthusiastic Radio Amateur under the call sign of G3BHK, as the Honorary Organiser. Wide publicity of this initial attempt was given by the World Bureau.

It is interesting to record that despite the short notice given the event and the fact that weather conditions did no prove encouraging, quite a number of contacts were made, and the comments of those who did participate was so favourable (both from Scout and Amateur Station operator's point of view) that the Organisers were encouraged to start planning for the following year.

As Jamboree-on-the-Air grew to its present proportions, so did the need for greater organisation, and in response to requests from the participants of those early years, the Boy Scouts World Bureau took over the organisation, until now it has become an outstanding event in the World Calendar.

—Jack Nicholson (VK3AAN), Victorian Branch Organiser.

☆

MEET I1AGI

GINO ANTONUCCI
via Dagnino 25/14, Genoa Pegli, Italy.

Gino, aged 44 years, has been in Radio as an Amateur for only three years, but in those three years has acquired an Amateur Station that does credit to the owner-operator. Gino in every day life is a chemist. I don't think it would matter how you called Gino, he could return on the mode you used. Gino has worked 162 countries and has 149 confirmed.

On s.s.b. he has a KW Viceroy plus a linear (1 x 813 g.g.). Receiver is a KW77. On a.m. the transmitter is a home-made 140 watt, which uses two 6146s. For mobile and emergency work, Gino uses an NCX3 on 20, 40 and 80 metres with d.c. and a.c. power supply. For r.t.t.y., Siemen's Hell. The antennae are rotary beams, which comprise three elements on 20, three elements on 15, and two elements on 10 metres. He also has a ground plane for 20, 15 and 10 metres, plus a long wire on 40 and 80 metres.

Good for you Gino and more power to you. Thanks for the beaut letter, also the photos. May we all, through Amateur Radio, get to understand each other much better than we could without it. 73 from VK.

Bert, VK5BB.

ROSS HULL MEMORIAL V.H.F. CONTEST 1963-64 RESULTS

THE Federal Contest Committee takes pleasure in presenting herewith the results of the 1963-64 Ross Hull Memorial V.h.f. Contest.

From the comments received we feel that the deletion of the present scoring system for 6 and 2 metres under a distance of 50 miles between stations would be justified. Consequently we will recommend to Federal Executive that the scoring table be changed in this regard.

Some contestants suggested that the distance be 75 or 100 miles, whilst several thought that a return to the State contacting State system would be preferable. To quote one of the contestants: "Working all local stations puts stations in remote areas at a disadvantage to those located in areas of high local v.h.f. population."

The above change to the scoring table would eliminate the daily scramble for numbers in metropolitan areas and at the same time give the country contestant a fair chance in the Contest.

Another suggestion worthy of consideration is that the duration of the Contest remain as at present, but that the period for which a contestant may submit a log be reduced from one month to nine days or sixteen days. This may increase the number of logs submitted and increase activity. At present it seems that a number of Hams compete in the Contest for a couple of weeks and then become disinterested for one reason or another and do not bother to send in a log because their chances of winning the Contest are small. One line of thought is that a contestant would be prepared to concentrate his activity in say a 9-day period but still operate over a period of one month. He would forward a log for the nine consecutive days in which he scored the most points. This suggestion has some merit. What do you think?

This year's honours go to VK5ZDR, M. J. McMahon, with a score of 7,746 points, and was a very fine effort. In conclusion we would like to congratulate the other award winners and thank those who competed and submitted logs.

—Federal Contest Committee, W.I.A.

TROPHY WINNER

VK5ZDR—M. J. McMahon .... 7746 pts.

AWARD WINNERS

Section A—Transmitting, Open

VK2ASZ—R. L. Lear	2051	pts.
VK3QV—D: H. Rankin	1048	„
VK4PU—J. D. Purdon	597	„
VK5TN—B. G. Tideman	1388	„
VK6HK—D. E. Graham	1262	„
VK7DK—D. H. Kelly	874	„
ZL3RZ—G. Burrell	1210	„

Section B—Transmitting, Phone

VK1VP—E. Penikis	2147	pts.
VK2ZCF—R. C. Norman	2791	„
VK3ZNJ—K. W. Jewell	2503	„
VK4ZEK—D. J. Gemmell	5294	„
VK5ZDR—M. J. McMahon	7746	„
VK6ZDT—T. M. Stanicic	2664	„
VK7ZAP—W. J. Henry	1858	„
VK8ZCX—J. B. Masters	1749	„
VK9ZBV—J. P. Hayden	514	„
ZL1AUM—C. Maddock	1530	„
ZL2AAH—B. D. Gibb	900	„
ZL3RK—T. J. McKenzie	1250	„

Section C—Receiving

WIA-L2242—D. J. Patterson	1333	pts.
WIA-L3138—G. N. Earl	2276	„
WIA-L5049—D. R. De Cean	195	„

INDIVIDUAL SCORES

Section A

VK2ASZ—St. Marys	2051	pts.
VK3QV—East Malvern	1048	„
3YS—Box Hill	227	„
VK4PU—Woombye	597	„
VK5TN—Kings Park	1388	„
VK6HK—Wembley Downs	1262	„
6MM—Nedlands	1052	„
VK7DK—Launceston	874	„
ZL3RZ—Westport	1210	„

Section B

VK1VP—Canberra	2147	pts.
VK2ZCF—Croydon	2791	„
2ZLP—Armidale	2158	„
2ZFB—St. Marys	1665	„
2ZFS—Goonellabah	1098	„
2ZSK—Dover Heights	627	„
2ZID—Woolongong	87	„
VK3ZNJ—Beaumaris	2503	„
3ZJQ—Edithvale	1608	„
3ZIG—Mildura	1019	„
3ZOL—Mornington	771	„
3ABP—Altona	483	„
3ZGL—Keon Park	308	„
3NN—Yanac	286	„
3ZOP—Moorabbin	195	„
3ZMS—Frankston	191	„
3ZOS—Yanac	180	„
VK4ZEK—Hawthorne	5294	„
4ZAL—Deagon	1689	„
4RO—Ayr	927	„
4ZGA—Ayr	811	„
4ZWL—Cairns	666	„
4ZBC—Cairns	578	„
4ZWB—Cairns	539	„
4ZJM—Gordonvale	247	„
4ZDG—Ayr	84	„
VK5ZDR—Henley Beach	7746	„
5ZBR—Gawler East	3633	„
5ZKR—	3427	„
5ZHJ—Gawler Rail	1728	„
5ZDX—Oaklands Park	1600	„
5ZK—Plympton	1524	„
5ZGF—Plympton	1505	„
5ZSG—Seacombe Gardens	1492	„
5ZJH—Somerton Park	1292	„
5ZEJ—Forreston	1107	„
5WV—Elizabeth North	920	„
5CL—Nermont	780	„
5ZBC—Mile End	379	„
VK6ZDT—Mt. Yokine	2664	„
6ZDS—South Perth	1422	„
6ZCD—Albany	1313	„
6ZDB—Nedlands	1255	„
6LK—Mt. Pleasant	1021	„
6ZAL—Bunbury	192	„
6ZAG—Mt. Hawthorn	126	„
VK7ZAP—Hobart	1858	„
VK8ZCX—Darwin	1749	„
VK9ZBV—Port Moresby	514	„
ZL1AUM—Auckland	1530	„
ZL2AAH—Foxton	900	„
ZL3RK—Christchurch	1250	„
Check Log: VK5NW.		

Section C

WIA-L2242—D. J. Patterson, Miranda	1333	pts.
WIA-L2211—R. C. Aberneathy, Miranda	1069	„
WIA-L3138—G. N. Earl, Black Rock	2276	„
WIA-L5049—D. R. De Cean, Brighton	195	„
VK5—Miss J. Martin, Wild Horse Plains	8	„

John Moyle National Field Day Contest 1964 Results

THE number of logs submitted in this year's Contest was less than last year and the individual scores were not as high as previously. Very few comments were received regarding the extension of the operating period or the change of the title of the Contest.

It is to be hoped that more operators will be enticed into the field for next year's Contest to increase the activity.

The logs submitted, generally speaking, were quite good, but some of the S.w.l's. claimed points for hearing fixed stations and this reduced some of the claimed scores quite considerably.

As in last year's Contest, the Multi-Operator Stations were very active and in most cases used all bands from 1.8 to 576 Mc., using a combination of home-made and commercial equipment. VK3APC had no fewer than 28 operators and junior assistants.

Transistorised equipment was quite popular, particularly d.c. to d.c. converters and transistorised modulators. Several operators used transistorised converters and fed them into car radios, Command receivers, etc.

The troubles encountered by operators were many and varied, and the following are a few selected at random. VK2NA, the Narranderra Radio Club station, operated at a spot called Dry Lake and had the misfortune to be washed out by a thunderstorm on the Saturday night. VK5OR, B. H. Bussenschutt, had transmitter trouble at the start of the Contest due to the unforgiveable omission (his words) of two vital high tension by-pass condensers in the transmitter.

The aerials used ranged from beams to 300-foot verticals suspended by hydrogen ballons. The G5RV antenna was a popular one.

In conclusion, we would like to congratulate the award winners and thank those who submitted logs and hope that we will again see you next year.

—Federal Contest Committee, W.I.A.

AWARD WINNERS

Section A (Portable, Phone)

VK1SB—S. E. Brown	174	pts.
2RX—A. R. Hennessy	399	„
3AAW—W. G. Wines	161	„
4ZK—R. M. Feenaghty	666	„
5TH—T. Mitchell	362	„
6JO—R. J. Skevington	142	„
7DK—D. H. Kelly	505	„

Section B (Portable, C.w.)

VK1SB—S. E. Brown	171	pts.
2ASZ—R. L. Lear	195	„
3APJ—P. J. Dettman	350	„
5ZF—I. L. O'Donnell	311	„
7CH—C. Harrisson	152	„

Section C (Portable, Multi-Op.)

VK2AWI—V.h.f. & T.v. Group of N.S.W.	597	pts.
3APC—Moorabbin & District Radio Club	2968	„
5LZ—Elizabeth Amateur Radio Club	3047	„

Section D (Fixed Stations)

VK1RD—R. Davis	580	pts.
2APK—D. F. Kiesewetter	645	„
3XB—I. Stafford	470	„
4LT—A. E. Carter	240	„
5RR—R. G. Harris	265	„
7SM—S. G. Moore	580	„

Section E (Receiving)

VK1—J. Watson	440	pts.
WIA-L2033—D. W. Shephard	280	„
WIA-L3042—E. W. Trebilcock	695	„
WIA-L2233/VK4—R. Erwin	165	„
WIA-L5065—A. Raftery	190	„
WIA-L6021—P. W. Drew	55	„
VK7—R. W. Mutton	305	„

INDIVIDUAL SCORES

Section A (Portable, Phone)

	Pts.		Pts.
VK1SB	174	VK6JO	142
2RX	399	6MM	68
2ASZ	189	VK7DK	505
2VL	67	7KH	108
2DU	40	7CH	74
VK3AAW	161	7AL	36
3JO	147	7ZAI	26
VK4ZK	666	7ZAS	26
VK5TH	362	7GV	20

Section B (Portable, C.w.)

	Pts.		Pts.
VK1SB	171	VK5OR	57
VK2ASZ	195	VK7CH	152
2VL	50	7DK	50
VK3APJ	350	7GV	27
VK5ZF	311		

Section C (Portable, Multi-Op.)

	Pts.		Pts.
VK2AWI	597	VK3YS	223
2ANT	349	VK5LZ	3047
VK3APC	2968		

Section D (Fixed Stations)

	Pts.		Pts.
VK1RD	580	VK4LT	240
VK2APK	645	4VX	115
2ALZ	190	VK5RR	265
2OO	170	5CL	190
2AAH	145	5WC	140
VK3XB	470	VK7SM	580
3AXK	275	7RY	50
3EF	270		

Check Logs: VK5LD, VK5CV.

Section E (Receiving)

VK1—J. Watson	440	pts.
VK1—I. Raine	355	„
VK1—A. Davis	165	„
WIA-L2033—D. W. Shephard	280	„
WIA-L2280—R. Bowden	90	„
WIA-L3042—E. W. Trebilcock	695	„
WIA-L3188—C. R. Christiansen	440	„
WIA-L3144—P. Gibson	430	„
WIA-L3138—G. N. Earl	405	„
WIA-L3158—R. L. Harrison	380	„
WIA-L2233/VK4—R. Erwin	165	„
WIA-L5065—A. Raftery	190	„
VK5—K. B. Rendell	105	„
WIA-L6021—P. W. Drew	55	„
VK7—R. W. Mutton	305	„

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THIS MONTH'S COVER

This is VK5ZC, A1 Penny, situated at Risdon Park, Port Pirie. A1 runs 150 watts a.m. from the MacMillan transmitter to a G4ZU. The receivers are an E.I.L. and an Eddystone 750. A keen and efficient c.w. operator, and for this A1 uses the bug. He is the proud father of one son and two girls. After spending some time at the Channel 7 transmitters in Adelaide, he has returned to the old firm of H. G. Palmer, where he is service manager for their local branch at Port Pirie. Always eager for the chance to join in a contest, A1 has many certificates to his credit. At the moment he's busy putting ointment on the itch that he's getting from s.s.b.

—Bert, VK5BB.

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

A small boy, when asked to give an example of co-operation, said: "Two cows standing side by side, facing in opposite directions, each flicking the flies off the other's face with its tail". That may be more a definition of co-operation, but it does give the right idea.

Co-operation requires the parties concerned to work together to a common goal. It requires a clear knowledge of what the goal is and it often requires correct timing. Some men are stronger than others, some are bigger, some are naturally quicker, but in team work everyone must co-ordinate his effort. The team must work as a unit. This, too, requires every member of the team to pull his weight. Remember; when you work together—work together.

A BRIEF INTRODUCTION TO TRANSISTORS

Fundamentally the transistor is a valve which controls the flow of current carrier (electrical charges in motion) through the semiconductor crystal material of which it is made. As the current carriers pass through the transistor they are controlled as easily as if the same current carriers were passing through an electron tube. This ability to control current carriers and their associated voltages makes the transistor potentially the most useful single element in modern communication equipment. In increasing numbers transistors are being used in radio, sound, radar, facsimile, telephone, teletypewriter, and computor equipment.

The history of transistors and semiconductors has been relatively brief and consequently only a few types have been seen. However, one type of crystal semiconductor has been used as a rectifier since the early days of radio. A crystal was lamped in a small cup or receptacle and a flexible wire (cat's whisker) made light contact with the crystal. Tuning of the receiver was accomplished by operating the adjusting arm until the cat's whisker was positioned on a spot of the crystal that resulted in a sound in the headset. Tuning a variable capacitor provided maximum signal in the headset. Frequent adjustment of the contact point was required.

It was not until World War II. that the point contact diode appeared. The point contact diode has a very low shunt capacitance and does not require heater power. These properties not only provide a definite advantage over the electron tube diode, but endear themselves to radar and other high frequency applications. The point contact diode consists of a semiconductor, a metal base and a metallic point contact. The connections to the point contact diode are an external lead welded to the metallic point contact, and an external lead welded to the metal base. The development of the point contact transistor was announced in 1948. The physical construction of the point contact transistor is similar to that of the point contact diode except that a third lead with a metallic point on the semiconductor is used. One lead is called an emitter lead, the other a collector lead. When the two metallic points are properly biased with respect to the metal base, the point contact transistor is capable of producing a power gain.

In 1949 the development of the junction diode was announced. The junction diode consists of a junction between two dissimilar sections of semiconductor material. One section, because of its characteristics, is called a P type semiconductor, the other an N type. The connections to the junction diode consist of a lead to the P type semiconductor and a lead to the N type semiconductor. The junction diode handles larger power than the point contact diode, but the junction diode has a larger shunt capacitance.

The development of the junction transistor was announced concurrently with the development of the junction diode. The junction transistor of two PN junctions. Operation of the junction transistor is similar to that of the point contact transistor, but permits more accurate prediction of circuit performance, has a lower signal-to-noise ratio, and is capable of handling more power than the point contact transistor.

Since the invention of radio itself nothing has had such a wide sweeping effect on communications as the transistor, and there is no doubt that in the near future new developments will be seen which will make the junction transistor as unwieldly as the electron tube is today.—Bob 2ZDA.

MORE CONTRIBUTORS

In August "A.R." I mentioned re the response from members towards our page. During the past month four more S.w.l's. added their contribution to the usual certain few. This, although only a small percentage of our number, is very much appreciated and maybe during the weeks to come a few more may pen their piece and so stop me from complaining.

To hand from the B.B.C. are copies of their pamphlets "Aerials for Short Wave Reception" and "Hints for Better Reception". These can be obtained by sending me a 9 x 4 inch stamped addressed envelope.

NEW SOUTH WALES

A very pleasing feature of our meetings of late are the new faces we are seeing. Also our country members who are on holidays in Sydney are paying us a visit. We would welcome any S.w.l. who happens to be in our city to come along to our meeting on the third Friday in the month. Last month Phil 2ZPI showed films of an interesting variety and has offered to do so again. We are indeed grateful for your co-operation Phil.

We extend a welcome as new members to our Group to Reg L2284, Mick L2295, Tom 1.2296, Harry Mortimer, and Peter Gush.

Sid L2258 is working on an S meter adaptor circuit which he hopes to have to offer S.w.l's at a later date. This can be adapted to s.w.-b.c. sets so should prove to be a very handy attachment.

Frank Kupljenlk has logged quite a variety of stations from 1.8 to 28 Mc., too numerous to print. Frank is studying for his ticket. We wish you all the best OM. Russell L2262 reports that his mobile set-up is working well. Owing to a mishap which damaged the insulator at the base of his whip, he is seeking a replacement. Could anyone supply or give a clue as to where he could obtain one. Russell's QTH is 91 Smart St., Fairfield, N.S.W.

Ray L2287 uses an AR7 rx with a xtal converter for 14 Mc. His antenna is a half-wave dipole and recently logged Ws, JA, KH6, FB8, and KG6 on c.w. Robert L2289 is another newcomer to the page, but is having rx trouble at the moment, so maybe next month we may hear of his doings. I do hope that my suggestions were of some value.

Don L2022, with listening time increased due to the wet weather, the old log book is rapidly being filled. Much interesting DX about, in particular on the 40 metre band, i.e. YV, G, UA, KZ5, PA0, HK, VE, YO, XE, VS1, and many others. Best QSL to hand lately JT-1KAB. Yes I guess when one is up in the 280s newies are hard to come by.

VICTORIA

It would be appreciated if a member of the L3 committee would let me know what is happening at their meetings as I feel sure that the members who cannot attend would be interested to know.

Eric L3042, recent QSLs received KR6, LU6, MP4, UF6, UH8, UI8, UL7, UP2, VS1, 5Z4 and VK3AAT/M. Has had QSLs from 102 countries during the first seven months of 1964, and has sent out 670 reports so far. Heard recently HL9, BY1, BY9, KZ5, G3, UL7, EA7, 9M2, ZP5 and MP4. In the recent ZL Memorial Contest, logged 51 stations for 560 points. Eric is motoring to VK4 and on his way back via VK2 I hope to meet up with him for the first time.

Noel L3101. Thanks for the very informative letter OM. Noel has received DX awards from "Popular Electronics", and any member interested should write to Hank Bennett, P.O. Box 254, Haddonfield, N.J., U.S.A., who will be only too pleased to oblige.

Lloyd L3141. Welcome to the page OM, and many thanks for your letter. Only too pleased to add your name to the DX ladder. Lloyd uses a home-brew rx with 18 tubes plus all mod. cvons., whilst his antenna is a half wave dipole on 14 Mc. Mac L3074 is awaiting his L2 number and rings me several times a week. He asked me to pass his regards on to all his friends in VK3 and to say that all is well with XYL and himself.

Peter, of Piangil, way out in the west of the capital, is a very keen S.w.l. I trust that all my answers to those many questions were to your satisfaction.

QUEENSLAND

Henry L4071, being a member of our Armed Service, is only active as an S.w.l. when spare time permits. His rx is an HE30 and uses tuned antennae on 40 and 80 metres. Lew L4020 tells of how he is trying various types of aerials, and of investing in an aerial tuner, plus a story of some fish that he caught, but did not send a photo to back up his statement, hi. Recent loggings are K7, KL7, WB6, VJ7, SM5, DUI, and VS1.

SOUTH AUSTRALIA

Alan L5065 reports that he has received QSLs from KI, VS1, W7, WA4, VE6, 9M2. I am pleased to hear that you are moving to a quieter QTH, that is so far as radio is concerned, and with the prospects of that 100 ft. tower you should rapidly climb up the DX ladder.

WESTERN AUSTRALIA

Peter L6021. Although the weather has not been too good Peter says that the DX is best on 40 mx with only Ws and Far East on 20. QSLs received: IS1, KH6, ZS4, OE3, DL0, SM7, EA7, CR7, 4S7, G8, DL9, DJ8 and many others.

Well gentlemen, that seems to be the end of the news from here. Thanks to Bob 2ZDA for the article and all the above chaps for their letters, and I hope to hear from a lot more members in the near future. 73, Chas L2211.

S.W.L. DX LADDER

	Countries Conf.	Countries Hrd.	Zns. Conf.	S.s.b. Conf.	S.s.b. Hrd.	W Stat.
E. Trebilcock	282	289	40	—	—	50
D. Grantley	124	281	38	20	124	35
P. Drew	112	240	31	55	203	29
A. Westcott	93	159	31	9	107	11
M. Hilliard	89	241	33	35	169	12
M. Cox	84	232	30	51	163	21
G. Earl	63	150	28	43	133	7
C. Aberneathy	60	102	32	—	—	14
N. Harrison	55	172	31	22	64	37
I. Thomas	42	139	20	16	97	14
L. James	41	142	23	29	122	9
R. Beckley	27	47	19	—	—	—
A. Raftery	14	117	15	—	—	—
R. Oats	9	26	8	—	—	—

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NEW CALL SIGNS

MAY, 1964

VK1VK—S. Grimsley, Dpt. Astronomy, Australian National University, Mt. Stromlo.
VK2AU—E. L. Koller, 54 Memorial Ave., St. Ives.
VK2SX—F. R. A. Jenkins, 55 Wattle St., Haberfield.
VK2AOK—Mrs. H. A. Grouse, 17 Ivanhoe St., Marrickville.
VK2BAM—A. A. McCullagh, 25 Boyle St., Balgowlah.
VK2BBD—B. J. Dwyer, 38 Highgate St., Bexley.
VK2BDC—K. Khan, 14 Woodward Ave., Strathfield.
VK2BSB—S. Brown (Miss), 64 Marmong St., Marmong Point.
VK2ZEE—D. Searcy, 23 Government Rd., Beacon Hill.
VK3KY—S. G. Mann, Flat 2, 12 Wattle Ave., Glenhuntly.
VK3WP—B. J. Davey, 19 Charlesworth St., Laverton.
VK3AKS—H. E. H. Michell, Station: 258 Moreland Rd., Brunswick; Postal: P.O. Box 386, Hamilton.
VK3ARH—R. A. Hallamore, 15 Hall St., Brighton.
VK3ZBD—C. McK. Cook, 10 Foch St., Ormond, S.E.9.
VK3ZCK—C. K. Maude, 2 Clarendon St., Avondale Heights.
VK3AZW—T. E. Wooley, Flat 3, 27 Southey St., Elwood.
VK4HO—G. R. Crosier, 48 Algoori St., Moringside.
VK4QF—W. A. Bentson, 32 Kingsholme St., New Farm.
VK4ZBN—W. M. Bryce, 9 Raymond St., North Ipswich.
VK4ZMI—L. B. Noseda, 10 Rose St., North Ward, Townsville.
VK4ZMJ—J. R. Morgan, 2 McKewen St., Bundaberg.
VK5BY—B. L. Weeks, 8 Coolah St., Kilburn.
VK5EK—A. C. Rechner, 36 Rayneham Rd., St. Peters.
VK5EP—K. M. R. Doherty, 22 Railway Tee., Hove.
VK5WE—D. A. Campbell, 10 Turnbull Rd., Enfield Heights.
VK5ZRL—R. W. Lee, 3 Adamson Ave., Belair.
VK6MW/T—W. H. Murden, Flat 14, 118 Terrace Drive, East Perth.
VK6ZBA—P. Buzzard, 56 Moulden Ave., Mt. Yokine.
VK6ZBY—J. M. Young, 59 Melvista Ave., Claremont.
VK6ZEF—N. R. Crosby, 42 Tuart St., Bunbury.

D X

VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Well this month I have been reading up on the DX notes published in some editions of "CQ" and "QST" for the year 1952-58. I could hardly believe that things were so good in those days gone, now so far left behind. Most of us will remember with a touch of nostalgia those days, when the bands were popping most of the day and night. This is leading up so I can show you how difficult it is for the poor sub-editor to scrape enough together for one issue. Those days I could have written a page about one particular band.

We must surely be scraping the bottom of the proverbial barrel! OK then, let us make ourselves more efficient by making that beam, overhaul that receiver, build that converter, and do that job to the aerial tuner that we have been putting off for so many months. Let us accept these conditions as a challenge. DX news is about as scarce as the reports I am receiving for this column.

160 Metres: No reports and at my location the noise is too high for concentrated listening.

80 Metres: No reports of any type of activity DX wise. On interstate working this band is continually changing in skip distance.

40 Metres: Quite a lot of ZL contacts can be had here at very good signal strength. Some G contacts are still to be had around 7.1 Mc. at 0630z. Arie 2AVA still seems to be able to get through from Springwood, but the actual amount of stations available seems to be getting less. This reference to s.s.b. Plenty of contacts on c.w. can be had. Very solid QSOs to W, KH6, KC, KJ on s.s.b. if you try from 0700z for a couple of hours. You may have to steer some clear of the commercials but it's well worth it if you are interested enough. Some good sigs from the north can also be had providing you can stand the QRM. Give it a try sometime, you may be surprised what you can do.

20 Metres: Still no exotic DX is forthcoming and you have to be lucky to get a real rare one. No longer can it be done with a dipole. Some Latin Americans can be heard during the a.m. hours, but conditions are such that you have to listen intently or you are lost, for each one that bobs up there are five VKs calling. Central America follows from 0330 for an hour or so, but this varies daily. More activity from XE this month, which is good to see. Then W for two-three hours each day. VE sigs seem to have dropped off a little but there are still plenty to be had. Not many from KL7 and a lack of JA on this band. Some activity from the African continent, sigs not over strong, but quite workable around 0700, but some days nout. Most from here are early risers and take their Ham activities seriously. Long path to Europe in the early a.m. hours, but not tried from this QTH.

15 Metres: An occasional break through to the States around 0430z and I think the JAs are coming back in the early a.m. hours. Should improve in a couple of months.

10 Metres: No reports from in or out of VK.

ACTIVITIES

CE0ZR/MM heard working on s.s.b. 14275 kc. bound for New Zealand 0230z.

VS5MH operating from Brunei, bobs up occasionally with borrowed s.s.b. gear. He does not know how long it will be before the gear has to be returned. If you need Brunei and get him, QSLs go to Box 777, Singapore.

Roy KH6BGS proved an interesting contact. Says he will be visiting VK and hopes to settle here. If you'd like to twist his arm, he is on 14260 kc. most days at 0715z.

Senator Barry Goldwater, K7UGA/6 caused quite a stir when operating from his hotel in San Francisco. Reported some VKs worked him. Quite a shot in the arm for Amateur Radio operators.

TI2BW from San Jose is looking for contacts from VK on the low end of 14 Mc. s.s.b. QSL to P.O. Box 4460, San Jose, C.R., around 0430z.

ZS2MI, Marion Islands, has a new QSL Manager, ZS5JY. (3TL)

5Z4AA is active on the low end of 14 Mc. (3TL)

Rex Vidicombe, late of Melbourne, is operating under the call of EL2F on 14260 kc, s.s.b. with 1 kw. He would appreciate hearing anyone from VK giving him a call. Try 2000z. QTH in column. (3ALD)

VK9RD is active on c.w. from Norfolk Island, while Ray VK9RH is on a.m.

Ken VK3TL heard working 7Q7LA on approx. 14.1 Mc. around 0630z.

Reported that FH8CD is active on 14 Mc. s.s.b., but as yet frequencies not known at time of compiling notes.

CR6CA is also active on 14 Mc. s.s.b.

Harry VK2LX, on holidays working mobile with the Swan, has been heard working W and VE stations.

Muriel VK2AIA and Hebe VK2AOK have been making their presence felt on the DX scene. These XYLs don't miss much and some pretty good sensible operating from both these girls. How's the housework, girls? Keep it up.

Wally is operating from ZA Albania, nothing definite about call sign or frequency, but it is reported that he's using HT32B plus linear to a 2E beam.

Heard a whisper that UP2KZA is also very active on 14 Mc.

Should be an influx of maritime calls from W land as rumour has it that there are at least five vessels to come to VK. First one was W6ACH.

The top W sigs on a.m. about 14205 kc. seem to want to do it the hard way, all running very strong signals and the maximum power, and all within a few cycles of one another. I don't know what they are trying to prove, but to me it proves they are very hard to copy when a couple of 6s and 5s get on together.

I see that Ralph's VK5TR article on cubical quad has at long last made the grade in "CQ". How about some more from VK having a go?

ZL1ABZ, transmitting from the Camedec Islands, is on Sunday Island and can be heard on 7080 kc. on most week-ends at approx. 0805z s.s.b. He will be returning to ZL in November.

Al VK5ZC is rumoured to be the winner from VK5 of the ZL Memorial Contest.

Ken VK3TL was possibly the first VK to contact the new Malawi Republic with his working of 7Q7LA. Congrats. Ken. Ken also advises that the QSL address of the above is Box 41, Zomba. F9RY/FC via HB9TL. KG4AM is Box 32. Navy 115, F.P.O., New York, N.Y. (Tnx Ken.)

Bruce VK3BM, in a short note re 160 metres, says that most of the DX boys on this band are using vertical antennae with much more success than with the ordinary dipole or long wire. He urges those that are looking to this band for its next opening that they would be well advised to adopt this type of antenna. (Tnx Bruce.)

5B4IP is now active on 7 Mc. a.m. from Cyprus with 150w. and g.p. antenna. Reported, but not confirmed, that Gus is off again to 8Z4, 8Z5, then to AC5, and will be using Hammarlund equipment.

KG6IF has several operators from Marcus Island to give s.s.b. contacts from there.

CP8AB is a missionary who operates from the jungle, 350 miles from civilisation in Bolivia, S.A. Operates on 15 mx s.s.b.

8F2ER requests QSLs via Box 405, Djakarta.

TC3ZA is an American in Turkey who is on c.w. 14085 kc. during the week-ends.

ET3CC operates c.w. on 14051 kc. at approx. 1400z.

CR7CR, Carlos, has been working many of the VK boys with his 300w. tx and 3 el. beam from Mozambique, Pot., East Africa.

QTH CORNER

DL1AV—Horst Dorn, Grossender Muenchen, 138 Issmaning, Obb.
FL3I—Bernard Aliamer, 138 rue Ordener, Paris.
VE7AEW—K. L. McMillan, 3511 Allan Rd., Lynn Valley, Nth. Vancouver.
9K2AK—E. P. Pout, C/o. Kuwait Oil Co. Ltd., Ahmadi 4.
9U5DJ—A. Fabel, Mecanicien T.P.M., Usumbura, Burundi.
9G1DN—John Parnell, P.O. Box 128, Dunkwa.
LA7PA—Ragnar Gustavsen, Tjernegt, Risor.
ZS6AOW—Dr. A. E. Mills, P.O. Box 12, Mondeor, Johannesburg, Tvl.
5T5AD—Alban Duffau, Posts and Telecoms., Nouakchott.
4X4MF—Amos Sovel, 5 Kalisher St., Haifa.
OH9NG—Johan I. Bergman, Pello F.
PY4APO—Jose A. Do Couto Filho, Pains, MG.
JA8RU—K. Nomura, W.18, S.11, Sapporo J.
3A2AY—R. L. Glaisher, QSL via G6LX.
G6LX—R. L. Glaisher, 279 Addiscombe Road, Croydon, Surrey, E.
EA9AP—Adolfo P. Real, Gral., Marino 24, Melilla.
LU1DEH—Jose H. Impaglione, Viamonte 377, Ramos Mejia, BS., AS.
ZE1JE—Mrs. Molly Henderson, P.O. Box 460, Salisbury.
5R8BQ—Lois Core, C/o. Sotrassum, P.O. Box 105, Fort Dauphin.
ZP8AJ—Miguel Stete, Pilar, Neembucu.
5U7AC—Yves Anatole, P.O. Box 1002, Aeroport, Niamey.
ZS4GG—G. King, North West Command, Uppington, C.P.
VQ2MB—R. M. Bourne, P.O. Box 1082, Broken Hill, N.R.
VP7NA—Harold K. North, P.O. Box 5197, Nassau.
VO2WW—William Walker, P.O. Box 94, R.C. A.F. Station, Goose Bay, L.
YS2RC—Rafael Aguilar M., Colnia Santa Lucia, Santa Ana, S.
AP2NM—Nazar Mohamed, Telephone Ind., Pakistan, Haripur.
F9VR—Robert Brochut, 11 Boulevard Dellesert, Paris 16.
VR4CB—Colin Blair, P.O. Box 53, Honiara, Guadalcanal.
SM5BQB—Allan Ostermann, Hard, Stockholm.
PZ1BG—R. F. Nassief, P.O. Box 928, Paramaribo.
OZ7NJ—J. Nielsen, Falkonervaengt 7, Copenhagen V.
GM3IQS—A. G. Walker, 1 Saxon Rd., Knightswood, Glasgow, W.3.
EL2F—R. Vidicombe, via Radio ELWA, P.O. Box 192, Mooroola, Liberia.

Name of country to follow all the above QTHs.

STATIONS WORKED FROM VK

Ken VK3TL has worked on 20 mx s.s.b.: ZS2MI, TI2HP, KG4AM, 5Z4AA, 5Z4AM, 7Q7LA and on c.w. VQ8BT. Best QSLs received: VP-3HAG, F9RY/FC, HZ2AMS/8Z5, 6Y5MJ, HZ1AB, 9Q5AB, FB8WW (Crozet).

Self: 14 Mc. s.s.b.: HR1SO, XE1S, XE1TQ, XE1EH, XE1NNN, XE1EK, XE1CE, KL7FAF, XE2VY, W6LCX, W6FMO, W6UJL, W6USX, W7GJ, W7UMJ, VE7HJ, WA4DYI, K4VCW, KH6BGS, W4MQ (LP), XE2DB, XE2GP, XE-1TK, W7UEG, VE7HE, W0HTH, CE0ZI/MM, VS5MH (Brunei).

Al VK5ZC: 14 Mc. a.m., W5HUM, W5LJJ, VE7AGS, VE7DAH, KJ6CC, W6IUL, VE7VC, ZE1BR, W6DOQ, and on c.w. K6VKP. 7 Mc. c.w.: ZE3JJ, K6QFX, W6ULS, W7ETK, WB-6OAK.

SUMMARY

The bands are now at their lowest although quite an amount of activity is still going on. The poor soul who has worked his 200 or so countries and is looking for his next, well he is scratching, but those who just want to work the stations available, he sure can have his six penneth of fun still. What amazes me is that just a few kilocycles outside the bands one can hear an essential service running at good strength from a certain area, but alas, no Amateur activity. I can't follow this.

Can anybody enlighten the writer and a few others on the limit of power on s.s.b. please? The local Amateurs from here would like to see this in print from an authority.

Very many thanks to Ken 3TL, Bruce 3BM, Garry 5ZK, Geo 5RX, and Al 5ZC for their unfailing continued support of this column.

73, Bert VK5BB.

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CALL BOOK MAGAZINE

The Federal Treasurer, W.I.A., is still in business with Call Book Magazines. This directory of Amateurs is published in two editions (1) American Amateurs, (2) Amateurs of the World except American (known as the "DX Listings").

The Treasurer has recent back numbers, which have been used by W.I.A. Officers and are in near-new condition, at £1 post paid. This is rather less than half price. Apply to Bob Boase, VK3NI, 50 Cardigan Street, Carlton, Vic.

V H F

52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

With the advent of spring and the approach of another v.h.f. DX season, the number of hours devoted to operating on 6 and 2 is bound to rise for most of us. This is going to mean a lot of fun, a chance to raise our tallies—and in not a few instances, more t.v.i. Even if your station is capable of getting into a lot of t.v. sets, you may not encounter much neighbour trouble, so long as you operate only at widely spaced intervals and for short periods. But when the operating pace picks up, so does the neighbour response.

Some of the discussions overheard on the air show that the Amateur in question has not the foggiest notion of what causes the t.v.i. or what to do about it. Too often he just lets the situation deteriorate, does nothing to correct it, or help his neighbours. When this happens they are bound to explode eventually—and being able to prove his transmitter is "clean" will be no solution to the mess he is in by then.

It may be true that the transmitter is not at fault, but nothing is gained by jumping up and down and declaring this fact in angry terms. For some years now, t.v.i. (all kinds) has been far more a public relations problem than a technical one. We know that t.v.i. can be cured and that often the cure must be made at the receiver end. But your neighbour doesn't know it, and you will get nowhere in convincing him, unless you are willing to lean over backwards in the matter of neighbourly co-operation.

Rule 1: Don't let t.v.i. drag on. If you know you have it, get to work. You have to convince the t.v. owner that you are at least interested as he is in clearing up the trouble.

Rule 2: Never lose your temper. Once you and your neighbour start shouting at each other you are done for. No matter how angry he gets, you must keep cool. Better yet, keep friendly.

Rule 3: Learn the causes and cures for t.v.i. Be sure you know what is actually causing the trouble and that you know how to fix it. The initiative and knowhow must come from you—the owner or the serviceman will almost certainly be of no help.

If you cannot obtain the co-operation of the neighbour you should enlist the services of the R.I. who will assist you in this matter.

From the July issue of the "West Australian V.h.f. Group News Bulletin": "The committee of the Group announced that the winner of the Parkes Trophy for 1964 is Charles 6LZ. This award was made for Charles' work on 432 Mc. tx and rx in particular, as well as his earlier work on 576 Mc. Charles is the co-holder of the present VK6 record for 432 Mc. and co-holder of the Australian 578 Mc. record. Sept. 12-13 is listed as a V.h.f. Field Day in VK6. 6KN reports Channel O was around on Sunday, July 19, at 1010 hours W.A.S.T. A coincidence being that in 1962 on July 15, 50 Mc. was open from VK8 to VK2, 3, 4, 5 about the same time." This issue contains the constitution of the W.A. V.h.f. Group, which could be used by any Group wishing to cover these same objectives. Keep up the good work, VK6 V.h.f. Group.

Further news has arrived regarding the new 144 Mc. record between W6DNG, Long Beach, California, and OH1NL in Finland, which resulted in the first West Coast U.S.A. to Finland two-way QSO above 50 Mc.

It took place on April 12, 1964, and represents the longest 2 mx QSO by Moonbounce. The gear at W6DNG comprises eight 7-element Yagis stacked 4 x 2 with an "honest" gain of 10 db. per bay. This can be elevated in angle above the horizon as well as azimuth. Some 59 odd antennae were tried in the cause of their attempts and the one used found to be the best. The transmitter was 1000 watts c.w., the receiver a 416B pre-amp. to a nuvistor converter and a 75A4 with noise blanketer plus an audio filter. OH1NL used a 32 element colinear, 2 mx converter into CR100 receiver, and the transmitter 600 watts to a pair of OB3/300s. Sigs were S2-3 both ways.

The effort took place over a long period of time, although signals were heard on many occasions. No two-way was made until April 12. W6DNG found that conditions were best when the moon was high and the air clear. This is in line with previous experience which suggested that haze disperses the signals. The big question was polarisation; both normal (vertical and horizontal) and circular were tried and echoes from the moon were received by all types, however horizontal polarisation was used for this effort. Our congratulations to all concerned and trust that the Amateur spirit will continue with "bigger" and better DX for those who try next.

Your scribe would be pleased to hear from any v.h.f. visitor to Melbourne. When in Melbourne contact me by phone (home) 35-8577, (business) 307-2341 (9-5). Any news items will be greatly appreciated. Your Group Bulletin or Newsletter, and individual items of interest would be most welcome.—VK3ZGP.

NEW SOUTH WALES

V.h.f. F.m. Activity in VK2: Frequency in use is 146.00 Mc. and we have now started putting in our number 2 channel, which we have made to coincide with VK3, i.e. 145.854 Mc., and a few are already on the second channel. We anticipate putting the second channel off the air for the whole period of Oscar III's. flight, since its beacon transmitter is only a few kilocycles away.

Main make of unit in operation is the T.C.A., which uses a 3/12 final, and after mods., the rx gives around 20 db. quieting for 1 uV. in, but to help things along, most of the net have installed either series cascode front-ends, or Nuvistor pre-amps., giving as good as 0.1 uV. sensitivity in the better units. Polarisation is vertical, and base stations run up to the full 150 watts.

Numbers are rising quite fast now. From the first two (2ZSE, 2ZBL) over 12 months ago, we now have about 30 and most of them mobiles, with at least five more to come on in the next couple of weeks. I'm quite happy too, now that I have my all transistor rig going—23 transistors, 0.4 uV. to open the mute, and 700 milliwatts output from the rx, using nickel cad. batteries, which gives up to 10-12 miles whip to whip.

There is no 6 mx net here, and no move afoot to start one. Normal 6 mx operation is very spasmodic. 73, 2ZBL.

Your Sub-Editor (3ZGP) has received a copy of the V.h.f. Newsletter No. 3, a monthly publication of the VK2 V.h.f. Group. Unfortunately it arrived too late to disect it for items of interest, but a quick run through of its 13 pages was enough to convince me that the Group, through its Editorial Staff, has the makings of a really interesting Newsletter. Those interested should contact the V.h.f. Newsletter Mailing Dept., C/o. Horrie Lapthorne (VK2HL), 523 Pacific Highway, Artarmon, N.S.W. The annual subscription is 5/-. —3ZGP.

VICTORIA

Over the past month all bands have been fairly inactive. A new net has started on 6 mx, the Western Suburbs Net, and at the time of writing they have not had any complaints of t.v.i. Cyril 3ZCK, Les 3ZPB and Vic 3ZPV are putting the finishing touches to 6 mx tx's, each will be running about 30 watts.

Fox Hunts: 2 mx Fox Hunts are held every third Wednesday and are usually attended by five or six hounds—these are getting more popular.

2 mx Scramble: The last 2 mx Scramble, held in Melbourne, saw the total of 29 stations. The winner was Ken 3ZNJ who worked 19 stations in the 30 minutes allowed.

Lindsay 3YR and Geoff 3AUX can be heard on 1296 Mc. They are tripling from their 432 Mc. tx's.

A tape of a lecture by an R.I. from the Department on T.v.i. will soon be available for loan from the VK3 V.h.f. Group. 73, 3ZCK.

QUEENSLAND

Last month a number of new call signs appeared on the v.h.f. bands. Jim 4JA and Walter 4ZPW have both made intelligible noises on 144 Mc. Ross 4ZRD and Reg 4VX have made their debut on 52 Mc. Reg 4VX takes pride in informing me he is a genuine refugee from 20 mx sideband. Walter 4ZPW is operating from St. Leo's College at the University of Queensland. Space is a problem and at the moment he has to fire through 40 feet of concrete to have a contact. There is an obvious moral to this story. Put a ground plane up Walter and give the r.f. a fair go!

Ron 4ZK will be operating from VK8 on 52.2 Mc. every Sunday afternoon and evening from November onwards. He will be using 100w. and will be looking for contacts.

Tom 4ZBH and Phil 4ZEP, although not new to the bands, both have made recent contacts on 2 mx. We also expect 4OS, the Oakleigh Boy Scouts, to wire up their 2 mx gear in the near future. John 4ZWB is having trouble with QRM. Although his QTH is Dalby, about 85 air miles from Brisbane, one evening he had a hectic time trying to sort out the call signs calling him on 2 mx.

At the moment Roy 4ZRM is having a holiday. However he also has a broken leg to keep him occupied and this is the reason for his stay at home. Roy has been on the air for quite a while now and suddenly he has t.v.i. trouble. However it seems that his tx was clean, but the 65 Mc. spurious was coming from his modulator.

What has become of the chaps up in Ipswich? Tom 4ZAL has had his bird perch in that direction but reports that he doesn't hear anything. There is quite a strong body of v.h.f. s.w.l's in Ipswich and to date more than seven persons are known to be listening around the 6 mx band.

The Jamboree-on-the-Air looks like being something on the v.h.f. bands this year. In particular, Vince 4VJ and Bob 4ZRC will be operating from Mt. Cotton and Mick 4ZAA will be at the Sandgate Scout Hall.

On 6 mx virtually all the activity is between 52 and 52.5 Mc. here in Brisbane. We have received sketchy reports from the south on frequencies in use there, but we would be interested to learn more accurately of these frequencies so we will know where to look in the DX season. This applies particularly to VK3. 73, 4ZPL.

SOUTH AUSTRALIA

Our usual correspondent, Al 5EK (formerly 5ZCR), having now been firmly attached to the ball and chain, is at present absent, enjoying the love and attention of a honeymoon. Rumours say he is probably headed towards VK8 land. We wish you well Al, and the v.h.f. notes will still be available for you to do when you return, dishes permitting. In the meantime, I shall do what I can to fill the gap.

52 Mc.: Activity still seems to be at a very low ebb. Admittedly S.A. has had more than its share of gale-force winds, heavy rain, plus sundry frosts, enough reason to keep many from venturing to the shack. Some are finding cross-band contacts to 144 Mc. difficult in areas of strong signal from Channel 9 due to serious spotting on 2 when transmitting 6. This does seem to be more pronounced where converters use an i.f. of 7 Mc.

No DX has been reported on the band since changing from 50 Mc. The report of the longest recent contact being made was between Herb 3NN and Mick 5ZDR, a distance in excess of 200 miles, signals 5 x 5 each way, and

THE BEACON BOX

VK5VF—

6 Metres — 53.000 Mc.
2 Metres — 144.800 Mc.

One call on c.w. then carrier for 40 seconds, then repeat, etc. Operation is almost continuous.

VK6VF—

6 Metres — 52.006 Mc.
2 Metres — 145.060 Mc.

Automatic c.w. identification with approximately four seconds key-down position. Operation: continuous.

VK3: ATV0—

51.75 Mc. f.m.

0900 — 2300 hours daily.
(100kw. e.r.p., 2600 ft. elevation)

very steady on 17th July. Mick regularly works Herb on 2 mx at varying sig. strengths. Geoff 5ZCQ now has 120w. to play with, having fixed the bugs in the new modulator which were holding up the usage of this new tx. Wally 5ZEH temporarily at Belair has been heard strongly on 53.1 Mc. John 5ZEP is being heard almost daily with his new mobile. 5UA, the University of Adelaide Radio Club, will be on 52.08 Mc. soon, looking for contacts mainly around lunch time.

Jack 5ZKW is a new station on the band and Leon 5ZMC at Morphetvale hopes to be on in 2 or 3 months. Ian 5ZIK is still looking for contacts from Yorketown on about 52.27 Mc. Bob 5ZDX is still off the air other than his mobile owing to the erection of a new tower 50 ft. plus tubing. The "Station with the big Sound" promises to be even bigger when the job is complete, especially if the results obtained by Garry 5ZK, who did a similar re-erection job, are any guide.

144 Mc.: This band has certainly shown a measure of activity unknown for some time in the past. If this can occur with cold wet nights, it augurs well for the warmer months ahead. Stations newly on the band over the last couple of months include Bob 5ZYX, Kevin 5ZAC, John 5ZEP, Mac 5ZLM (new tx), Lloyd 5ZGL, John 5ZJD, Joe 5ZJW, and Wal 5ZPW (using 24w. to halo antenna). It is reported Jim 5ZMJ shifted 10 truck loads of gear and rubbish, etc., to his changed QTH in the Port Pirie area (most Amateurs could be in the same boat!). Ern 5EN, also at Pirie, is now using four 13 element yagis 103 ft. high. Using 10 w. he can land a 5 x 9 signal into Adelaide 120 miles away. The recent gales have added a bend to the final section of the mast, much to the alarm and annoyance of Ern.

Talking of large aerial systems, Jim 5ZMJ is currently playing with ten over ten yagis in an effort to land into Adelaide stronger. News from the boys in the South East is very scarce although the grape vine states activity is quite strong down there. Some notes this way would be appreciated chaps.

432 Mc.: Not much to report here. John 5ZJH and Graham 5ZAD having crystal controlled contacts. Brian 5TN has completed his converter. Mick 5ZDR has a very satisfactory converter going, using a 7077 in the front end and with this has worked David 5AW at Penola, a distance of 220 miles. Mick reports signals 5 x 9 on 2 mx, and 5 x 7 on 432 Mc. for the cross-band contact. Though weaker, the signals on 432 were not subject to the QSB as on 2 mx. Eric 5ZEJ will conduct tests shortly on 432, using a converter supplied by Brian 5TN in an effort to try and span the difficult Mt. Lofty Ranges into Adelaide. The distance is about 25 miles, but the path very rugged.

General: Jim 5JB, formerly of Leigh Creek, is now living at Elizabeth, and has been heard on 2 mx. Kevin 5ZED is now 5EP. The VK5 gang would be pleased to hear concrete details of the operation or otherwise of any beacon tx's in other States. We are not sure whether the VK6 beacons are on all the time, and we know nothing of the other States—what about some details chaps? 73, 5ZEJ.

South East Radio Group: David 5AW and Herb 3NN are still making checks on 432 Mc. and have been having reasonable success. Herb now has his converter going and quite a few two-way contacts have eventuated. A 432 Mc. tripler from this QTH running an 832A has been heard by David 5AW at 5 x 7/8 over a distance of 35 miles. Also Chris 5ZFA has almost completed his 432 Mc. converter.

144 Mc. is still the most active band in the South East of the State. Contacts have been kept with Ron 3ZER on each and every evening this week, but signals have not been very good at this QTH. David 5AW and Herb 3NN have been keeping schedules on 2 mx and transferring to 432 Mc. if signals are reasonable. Jim 5ZSJ is on 2 mx again with plate and screen modulation to the 832A. He is running 25w. input and has an 8 element beam up 30 ft. Chris 5ZFA and myself (5ZKR) have also been active on most evenings of the week. Col 5CJ has been keeping schedules with Ron 3ZER and John 3ZDM over the week-ends.

At the present there is no activity on 52 Mc., but the sound channel from Channel 0 is audible all the time at this QTH. Chris 5ZFA has a converter and antenna finished and has only the 6 mx tx to complete and a few contacts will eventuate on 6 mx. 73, 5ZKR.

WESTERN AUSTRALIA

At the meeting on 27th July, Dennis 6AW was elected President and Don 6HK Vice-President. Harry 6ZBZ is the new Secretary. Rod 6ZDO has done a swell job over the last three years in this position. At the last Morse exam. on 21st July, 6ZEE and 6ZBA seemed pretty confident: Doug 6ZDW was notable by his absence.

In Geraldton some crayfishermen have a hard time getting through to land on 6280 kc. Recently a housewive, copying her husband on the dual wave set, had to ring through to base, because they couldn't hear him, and she was relaying messages for a couple of hours. A case for v.h.f.?

Heard Dennis 6AW on 2 mx last week-end, cross-band to Viv 6ZCM on 6. I first heard him faintly on 6 with the third harmonic from my 46 Mc. rock. It was some signal.

Techs in training with the P.M.G. get a £28 per annum proficiency allowance if they get 75 per cent. or more in all subjects. This is better than stripes, eh?

Roy 6ZBD is on a nice hill in Bayswater and should work much DX this year if his new mast survives the gales.

About a dozen chaps have W.I.C.E.N. mobile gear on 52.656 Mc. f.m. and should be useful at the next civil emergency.

Sunday, 25th July, the rain and wind storms were ghastly, old chap, and there was only one station on the air all day—6BE with a relay of the Wireless Institute news, and he closed down just as the news was getting interesting. One of his harmonics pulled the wall plug?

6LR, 6BE, 6ZAG are using 4E27s and several more are contemplating it. 1500v. at 100 mA. is a nice working temp. 6MM will be running a pair in AB1 this Christmas with 300w. p.e.p. (2000v. 100 mA. idling, 150 mA. max.). He also has a 60 ft. tower (home made too) and a 5 over 5 stacked yagi array. So if he doesn't work those ZLs, who can? If he does it may convince the boys there is summat in s.s.b., but they'll take some convincing. 73, 6ZAG.

PAPUA

V.h.f. activity has shown a marked increase during the last month now that the P.M.G. senior techs exams are over. 9ZGB and 9ZBV are active again, 9CK has been heard more often and we all welcome a newcomer in Bryan 9ZJD, who will soon be active on the bands. There is great activity in the construction, as 9CK, 9ZGB and 9ZJD are busy with bigger and better transmitters for 52 Mc. 9CK and 9ZBV are busy with converters for Oscar III.

52 Mc.: No signals outside local area heard during the last few months. 9CK and 9ZBV mobile, worked up to 48 miles during recent tests and might have done better but for the lack of further road.

144 Mc.: Small amount of local cross-band duplex work by 9CK and 9ZBV. 73, 9ZBV.

YOUTH RADIO CLUBS

Loads of news from VK2-3-4—new clubs springing up all over the place—many certificates earned. It makes very pleasant reading and a number of people can feel happy about it, but can we find another 100 club leaders? Perhaps a list of State Supervisors would help:

VK2—R. C. Black (VK2YA), 5 Bennett St., Kingsgrove.
VK3—K. Matchett (VK3TL), C/o. Burwood Teachers' College, Burwood.
VK4—C. T. Taylor (VK4UC), C/o. Clontarf Beach High School.
VK5—Rev. R. C. Guthberlet (VK5OD), P.O. Box 89, Mt. Barker.
VK6—L. Jessop (VK6ZEA), C/o. Wesley College, South Perth.
VK7—E. Beard (VK7EB), 146 Derwent Ave., Lindisfarne.

How is this for help from a Division Council? Thanks to the interest of the VK4 Council, clubs at Downlands College, Gymple, Clontarf and neighbouring De La Salle have each acquired an AR7 receiver!! There is also a regular Y.R.C. page in the Monthly Bulletin. Other news from VK4 shows a lot of activity in a short time. New club station at De La Salle, Clontarf (VK4DS) was "opened" on 1st August. New clubs on the way at Cairns High (19 members including five YLs, with leader another teacher, Alex 4MA), North Rockhampton High (20 members, with Silas 4SC, another teacher), Padua College at Kedron (with Rupert 4ID, who is a teaching Franciscan priest), Ipswich Grammar, Mt. Gravatt High, Goondiwindi High, Wavell High (looking for a receiver), and Downlands College (68—yes!—boys building crystal sets with Fr. Yelds). Eight Elementary Certificates issued (4 to Downlands, 3 to Gympie, 1 to De La Salle).

VK3 Newsletter No. 12 to hand. First Junior Certificates in VK3 to seven members of Korumburra High. The total of Elementary Certificates now up to 37 with three to Greythorn High, seven to Caulfield Grammar. Val Barnes, Y.R.C. Equipment Officer, has been receiving some equipment for distribution but can take a lot more. Bruce 3ZMA has joined the staff of Collingwood Tech. and assists the club. Activity reported at Caulfield High but no club leader yet.

VK2 clubs keep rolling along in their multitudes. Well, at least we have our nose in front for the present, but will welcome all challenges. New clubs reported at Fort St. High, St. Mary's High, Auburn Marist Brothers, Kingsgrove North High, and North Strathfield Boy Scouts. The last group benefited from a working receiver donated by Gordon Kinnear, of Pymble. Another fine donor was Graham Hall (2AGH) who donated a large quantity of capacitors and some new transistors. The quantities were such that many clubs will get a parcel—many thanks to Graham. Also generous was Mr. J. Hancock, in charge of the I.B.M. Reconditioning Dept. at Lidcombe, who donated an obsolete computer section containing many useful components including twin-triodes, 7- and 9-pin sockets, etc. He has also offered to show small groups over the I.B.M. Computer factory. Interested club leaders should telephone him. Incidentally, Mr. Watkinson, of Amalgamated Wireless Valve Co., will gladly show groups through the factory. You have two very interesting visits there, all you clubs in Sydney or visiting the metropolis. Five good Elementary Certificates to Rex Black's group at Kingsgrove. Better still, the first Intermediate Certificate was gained by Gregory Dunne, of Kingsgrove, to whom congratulations!

The Institute of Radio and Electronics Engineers' pennant for 1963 success was presented to George 1GB and Roger 1RD, representing Lyneham High, on Canberra commercial t.v. recently, with suitable press publicity. It all helps the cause.

Only a little news from VK5 but it's good. Port Pirie Y.R.C. gained five Elementaries. Bob 5OD is getting some Divisional help, for which thanks! How about some news, Bob—if we're friends. 73, 1KM.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.T.U. FUND

As agreed at the last two Federal Conventions, Divisions were given target figures to meet towards financing representation at forthcoming I.T.U. Conferences. To date, the percentage of the target figures met are shown by States:—

VK2	—
VK3	25%
VK4	23.6%
VK5	—
VK6	21%
VK7	—

The above figures represent monies received by Federal Executive and not necessarily monies still held by Divisions.

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FEDERAL QSL BUREAU

Bob K6MQK requests the assistance of any VK Amateurs equipped to take part in the Moonbounce project. Stations would need the equipment for 12296 Mc. with at least 100 watts and a good antenna. He points out that startling results have already been achieved on lower frequencies and cites 144 Mc. contacts between W6DNG and OH1NL last April by Moonbounce.

The Korean Amateur Radio League reports progress and now has 400 members, 100 licences and 60 Amateurs. They plan an exhibition in April 1965 and desire photographs of typical Ham Stations. Photos should be 15 x 20 cms. Secretary is HM1AJ, Box 162, Seoul, Korea.

E. R. (Bob) Hattersley, VK9RB, ex-G3PJN, is currently active on Norfolk Island on 14 Mc. c.w. Bob expects to be on the island until at least January 1965. QSLs to Box 34, Norfolk Island. VK9RH also been heard on s.s.b. from same location.

ZL2ASM, Rex Glew, of Waiouru, N.Z., expects to be resident in Melbourne for about three years from a date in 1965. Rex will lift out a VK license.

Activity from Nauru is expected shortly. VK9NP presently en route to the island will serve two years in the area as a coastal radio operator.

G5KW is in Saudi Arabia for a period of several years and activity is soon expected on s.s.b. with a beam. Expeditions to neighboring countries are also planned. His call will probably be 7Z2KE.

The Spanish Broadcast Station EAJ1, Radio Barcelona, is celebrating its 40th anniversary on 14th November, 1964. Amongst other celebrations is the award of a Diploma for Amateur operation. For Oceania the award may be earned by two contacts, any mode, with ET stations who must be situate in Barcelona, Tarragona, Lerida or Gerona. Contacts should date between 1st June and 30th November, 1964. Award is also available to s.w.l. Full information from this Bureau or from EA3GI.

QSL traffic through the Bureau nosedived steeply during July when only 3,000 cards were handled.

—R. Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

Here is a warning to all those who would attend an auction sale. Take more than thirty shillings with you. It seems that it is not the thing to keep bidding when this is all the cash in one's possession. It certainly was the case at the August meeting of the Branch, held on Friday, 7th, at the Technical College. Members had been warned to bring their money but few had brought sufficient to purchase some of the exotic items of gear which were on offer. Gordon 2ZSG, a quiet man at heart, becomes a fiend when an auction is in progress, especially when he holds the hammer. As a result, many were the rude remarks passed to poor but honest members with only the humble thirty bob on their persons. Still, all who attended, and there were forty-three all told, enjoyed the entertainment and some of the gear went away in different hands from those which brought it. Lionel 2CS was the lecturer for the night and he showed and explained the mystic workings of a receiver with crystal front-end—just the shot for s.s.b. There are those among us who do not have to do any soldering and at least one clerical gent has followed the string to the back of the lounge chair, finding a Swan Transceiver at its termination.

If you were not already aware, the Hunter Branch Convention is only about four weeks away and, as before, this will be a three-day affair. The festivities commence on Friday, 2nd October, in the usual meeting place at the Tech. College when a constructional competition will be held. To enter, members must be prepared to display and describe some item of home-built equipment which has not been shown previously at a Branch meeting. The committee is to decide which item deserves most praise and a handsome prize is offered to the successful candidate. Even if you cannot use a soldering iron, you must be able to eat, and persons with this ability are invited to be the guests of the other gourmets at the Annual Dinner, to be held on Saturday, 3rd October, at the Prince of Wales Hotel, Merewether. The delicacies will be ready by 7.30 and the charge will be less than one folding pound per person. To make the whole business more interesting, this aforementioned fee will cover attendance at the Field Day on Sunday, 4th. This surely must be an encouragement to all the MacSutherlands and O'Halls to come to two events for the price of one. Those who are frightened they will be given a place at the same table as me will still have to pay the same amount for the Field Day only! What a cunning stratagem!

One of our YL Amateurs—and it should be easy to guess who, has been having some trouble with modulation when calling back to Monday night broadcasts. The fitting of one new valve cured the trouble (fancy not knowing when a filament is not alight!). The 80 mx transmission from 2AWX is not well received in the local area of recent weeks and there has been a good deal of interference from ZLs and interstate stations on the same frequency. For those who experience such difficulties, there is a good signal on 1820 kc. free of interference and fading. Many of the local listeners use this frequency and all report good strength. Because of relaying problems, the news from the v.h.f. outlet via 2ZSG is now from tape, prepared prior to the broadcast. This has meant a much improved signal on 2 mx.

It was pleasing to see so many of the Cessnock boys at the last meeting. Their club station 2AXC has been on the air frequently during the past few weeks with good reports. However, the remark made by Sherwood, "See you on the air," was the funniest I have heard for some time. Will someone please lend him a tx so that he may carry out this threat.

David 2ZXA has been notified of his success in the recent Morse test and he is now anxiously awaiting the issue of his full call, which may even be on the air by the time you read these notes. As well as the new A.B.C. station 2UH, there is a new station in the Upper Hunter with the call 2GV. Tas has done remarkable things with the rig and now has a super signal on 80. Frank 2FC also has chased all the wogs out of his gear and is a 5 x 9 signal to many. Jack 2AJY is reported to be considering a change of QTH and may be close enough to attend the meetings soon. Paddy 2AXU has done some remarkable things with aerials and has a greatly improved sig.

Membership at the Westlakes Radio Club has increased again and if all goes well, there must be a new batch of calls at the end of the course. The transmitting station at the Club is now on the air and has had some fine reports. It is said that Harry 2AFA called CQ the other day and this may be a very good omen. But on which will confound even the experts is the receipt of a card from Venezuela for 2AKX addressed VK2PMU (try 2AKX). Well I ask you, am I as saucy as all that?

The September meeting, on 4th, will feature four lecturettes and should be of interest to all. Remember, Room 6, Classroom Block, Newcastle Technical College. See you there. 73, 2AKX.

CENTRAL COAST ZONE

About 25 members and wives from the Gosford Radio Club had a most instructive tour round the Vales Point generating station recently and this was followed by a picnic lunch on the shores of Lake Macquarie nearby. We saw several 240 megawatt power transformers which didn't take up overmuch room. However they stepped up the voltage from 16 kv. to 330 kv. and that's a few volts! The place consumes 2.5 million tons of coal every year from the highly-mechanised nearby coalmines. Everything is conveyer belts and I understand it will need about seven staff when completed. Can you imagine electric precipitators working at 50 kv. and 100 mA.? That would cause a bit of QRN if not shielded by a metal box, I would think. With all that power to spare don't you consider 150 watts is a bit light on!

The club was grateful to Norm 2ALJ for a lecture on v.f.o. stability, and a visit from two members of the V.h.f. Group in Sydney. Our next lecture on "Undersea Cables and Repeaters" by a P.M.G. man should be very interesting. Len 2AMU has been working DX on 14 megs. from the shores of Tuggerah Lake and plans for a beam are being laid. Frank 2ACQ is retiring to Umina in the near future —it will be lovely to have the chief of slow-morse transmissions with us. He will be within shooting distance of Ron 2RV at Ettalong. Harry 2LX is continuing the contacts with Antarctica. His TA33 and wind-up tower makes things very easy. The 80 metre band has been showing some long-skip conditions resembling 40 metres lately. To work into Newcastle (40 miles distant) requires the use

SILENT KEY

It is with deep regret that we record the passing of:—

VK2VO—Vol Molesworth.
VK3JE—W. (Bill) Alder.
VK3NZ—R. H. (Bob) Hall.

OBITUARY

VOL MOLESWORTH, VK2VO

It is with sincere regret that the VK2 Division announces the sudden passing of Vol Molesworth, VK2VO, who died at Prince Henry Hospital at the age of 39 years.

Vol was a Past President and Councillor of the N.S.W. Division and for the last three years was Secretary of the Disposals Committee.

Vol was a Master of Arts, Lecturer in Philosophy and Logic, Lecturer in Business Administration, and author of many papers on Philosopy and Logic.

To his sorrowing relatives we extend our deepest sympathy in their bereavement.

of 160 metres on some nights. This must certainly be near the sunspot minimum. Heard 2AKX and 2MW on 160 the other night.

Wally 2AXH is back on 80 using an AT21 A couple of filters give complete freedom from t.v.i. One is a double half-wave 3.6 meg. tuned model, incorporating three series-tuned traps for Channel 2. The other is a regular three section low-pass filter which commences at 34 megs. George 2ADZ is having a spell in Concord Hospital, we wish you a speedy recovery George. Phil 2TX is planning a house on his Arcadian location and after that a beam antenna. Alec 2AAK and I will rejoice when the freeway into his orchard property is completed. At the moment the only free item is westerly wind and there's been too much of that. Antenna rotators and G5RV radiators are the chief sufferers.

Your scribe is searching for information on Desynn indicators and their power supplies in preparation for use on the cubical quad. 73, 2ON.

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VICTORIA

WESTERN ZONE

Trev. 3ATR, Warracknabeal, is on s.s.b. with a home-built Heathkit. He has also taken to flying and has now approx. 20 hours up solo. Roy 3AOS, Telangatuk East, has also taken to the air . . . less QRM than on the air. The radio club at the Keith Area School is in operation once again after a temporary lapse due to a staff problem. The operation is only among the basic principles at the moment, with quite a bit of s.w.l. We have had gear on the air but have the t.v.i. problem, being on the fringe here. Hope to have representation at the next Convention along with portable equipment for one or two school field days. Received a QSL from 4X4LN—no envelope, no stamps—a thought for the local authorities, free passage of all QSL traffic.

This scribe was run out of Keith, kept on upsetting Bourke's Law trying to get on to the Wednesday night Zone hook-ups. New QTH is now Laffer, about midway between Keith and the Coorong; only on 32v., but no t.v.i. Should be on 80 and 40 with 50w. soon. Already on 52.510 Mc. mobile and a similar set-up on 3.640 Mc.

The members will regret the passing of Luke 5LL, who only a matter of weeks prior had asked me to pass on his best 73 to the Zone.

Tony 5ZAI, Bordertown, has done a magnificent job in building his own brick home although I understand he has a little harmonic problem lately. Hope to hear some more activity (radio) from this QTH. Not quite as fluent as PanSy, so best 73, Barry 5YB.

QUEENSLAND

DIVISIONAL COUNCIL NEWS

R.D. Trophy: Laurie 4ZGL reported that Chandlers Pty. Ltd., a large electrical organisation here in Queensland, had agreed to display the trophy in the display windows at all their branches. Various suburbs of Brisbane will be included and the trophy will be shown for about two weeks at their branch stores in the larger country towns. This should give most VK4 Hams a chance to see a tangible result of their efforts in the Contest last year.

New members are being approved at the rate of about seven per month. It is also apparent that many of the new members are from the country. Recently applications for membership of the W.I.A. have come from places as far afield as Rabaul and Port Moresby.

Peter 4PJ gave a report on the Federal Convention and most of this report was printed in "QTC". Laurie 4ZGL has assumed the office of Federal Councillor and one of his first duties will be to arrange accommodation for the Federal Councillors and Observers from other Divisions who will be visiting Queensland for the next Convention.

JULY MONTHLY MEETING

Attendance figures for the monthly meetings have been very pleasing. Even though it has been winter (and we do have a winter in the Sunshine State), 60 members attended the July meeting. Peter 4PJ was asked to give a report on his trip to Mt. Macedon in VK3 where he attended a Civil Defence School. He was lavish in his praise of the accommodation and general routine of the school. When the meeting was closed and all general business had been dealt with, Vince 4VJ arose and with the assistance of Pat 4KB, gave an informative lecture on the antenna theory and practice. Most of the lecture was given in the dark while slides were being shown, but it was observed that every person present was so interested that no one tried to snatch forty winks during the evening!

IPSWICH DISTRICT RADIO CLUB

This Club seems to be one of the most progressive. Bill L4001, the publicity officer, has been doing a fine job in sending news for inclusion in the Sunday morning broadcast from 4WI. At the first meeting for the year 1964-65 a patron and three vice-presidents were elected. One vice-president elected was the Mayor of Ipswich, Alderman Finnimore. There is a moral to this story and other clubs might take note. The Ipswich City Council supplies the members of the Club with free QSL cards which, besides having the necessary information on one side, they have a full colour photo of the city of Ipswich on the other side.

The Club now has new rooms which are situated at the QTH of Warren 4GT. Warren has spacious room under his house and the work benches are well equipped with soldering irons, drills, etc. This equipment is mainly used in conjunction with the A.O.C.P. classes that the Club conducts. Club membership is now in the vicinity of 47 members. While on the subject of Ipswich, please don't ask Henry 4HC how many c.w. contacts he has had. Although Henry has been on the bands for a few years now, the answer to the question would be a positive integer which lies in value between zero and minus one.

QUEENSLAND YOUTH RADIO CLUBS

Regular news items from the Youth Radio Clubs have been published in "QTC" and frequent reference is made to the activities of the Clubs on 4WI. Most VK4s will know what is going on in the State along the lines of the Youth Radio movement (i.e. if they read official Division publications).

So most of the following is for other interested persons and to let the southern boys know that the spirit of Youth Radio is very much alive here in Queensland. At the helm is Chas 4UC. Claude 4UX has undertaken the job of official examiner. Apart from Radio theory and practice, the club members seem to learn to run scavenger hunts.

One of the main problems with Y.R.S. clubs is obtaining old unwanted items of gear and components. Old copies of such publications as the A.R.R.L. Handbook are needed—in fact any of the other radio magazines which are no longer required would be very welcome. A supply of Elementary Certificates has arrived and have been inscribed and presented to those who are pioneers in earning the first Youth Radio Club certificates in VK4.

Enquiries are arriving from far afield about the Y.R.S. and a booklet with information on the scheme is available for those interested. Clubs have been formed at Wavell High, North Rockhampton High, Cairns High, Downlands, Gympie, Clontarf High, Padua College and the De La Salle College. Bob 4RW, perhaps you can explain the lack of Youth Radio Club activity in Townsville!

By Sept. there will be four transmitting Y.R.S. stations in VK4. 4DS at the De La Salle College, has just begun transmission and naturally their first contact was with 4WI on their opening day. 4RP from Clontarf operated from the Redcliffe Show on 17th and 18th July. An attractive feature was a backdrop board displaying QSLs and Y.R.S. Certificates. Despite noisy conditions, 26 contacts were made.

GENERAL NEWS

In the last issue of "A.R." nearly every Division expressed hopes that they would win the R.D. Contest. If the large volume of publicity for the Contest here in Queensland is a guide to the end result, then I fail to see how any other Division could possibly have a chance of taking the trophy away from us. Anyway, we hope the trophy is here to stay for a while but only time will tell.

Who is going to be first to hear 4WQ, the Bundaberg Amateur Radio Club Station? Back in July, the tx, AR7 and power supply were installed but has the call sign been heard yet? Incidentally, I believe Jim 4JV has had trouble with pigeon lofts, both here and in Melbourne. At a certain working bee, Rusty 4JM acted

as a capacitive coupling between the h.t. of the rx and the coil box. He assured those present at the time that the rectifier was working well as it definitely was pure d.c. going into the coil box!

For some time now, Council has been looking for an Editor for "QTC". Judging by what we have heard on the air, we have members who have the ability to talk with authority and at great length on the subject of Amateur Radio. So show your skill at presenting Amateur Radio news to the members via "QTC". To those who are at all doubtful, "QTC" does not stand for "Queensland Turf Club".

Jamboree-on-the-Air time will be around again in about a month's time. The July issue of "Queensland Scouter" carried two pages on the Jamboree. One page consisted of a map showing the interesting contacts made on the air last year. Who will be on the bands this year helping the Scouts along?

The 1964 Sunshine State Contest went off quite well in the morning but was apparently a bit slow in the afternoon. Council would like to hear your ideas on whether it may be a good idea to stop about noon next year. I see where Vince 4VJ and Al 4LT were looking over the Mt. Cotton Scout Camp, "Karingal". It seems that they will be operating portable from this site during the Jamboree-on-the-Air.

I will close the news for this issue with an item of news which should cheer up Pansy 5PS no end. (I wonder if he reads the news from other States?). Vince 4VJ and Reg 4VX well known 20 mx sidebanders, have both appeared on 6 mx using that old-fashioned mode of telephony! I have to share 5PS' thoughts on s.s.b. since I don't even own a b.f.o. To prevent any thoughts that Bill 4ZBD doesn't own a b.f.o., I would like to add that Bill collects and supplies all the news printed in this column and his name goes at the end of it, but anonymous me just puts it into some readable form (and occasionally makes comments about s.s.b.). 73, 4ZBD.

TOWNSVILLE AND DISTRICT

Very pleasing to see in August "A.R." that the Publications Committee had published the two exerts from the Queensland papers. It only goes to show that we all should watch the papers to see and note information that may be used to the best advantage in regards to our hobby Amateur Radio.

Certainly PanSy did not miss out in forcasting the latest trend in men's fashions, while our worthy Editor capped it off.

Only visitor from the south this month was Newton 4QW on a brief visit to the North to escape the rigours of the southern clime. Charlie 4BQ acted as official while he was in the district, showing him all our latest industrial projects. Newton was awed by the large tower in Charlie's backyard; first impression was that it was the new Channel 3 mast. Charlie is hoping to work the world on 7 Mc. with the new quad he is constructing.

Hope to hear signals on the v.h.f. band now that Bill 4ZBE and Don 4ZDM are back in town, having left the city of "sin, sweat and sorrow"—Rockhampton. Sorry to report that our prominent s.w.l. for the north, Afton Westcott, is in hospital in Cairns with a severe bout of pneumonia, having been used as a pin cushion till he leaked and had to be put on tablets to plug the holes. Basil 4ZW, together with the rest of the locals there, are constant visitors. No truth in the statement that Basil intends keeping the receiver, says he is only keeping it in going condition.

Claude 4UX growling not enough time to play the bands, what with sitting in the supertech. chair and plenty of overtime, hoping that the unseasonable weather will be kinder to the staff and not so much sickness. Trying early to get the locals organised for the Scout Jamboree-on-the-Air in October and has earbashed all the locals to be on for "R.D." and not fail to submit their logs. Maintains he examines the results and hears chaps on the air swopping numbers and fail to forward their logs (what a shame, it helps the other State win).

Notice lately the growing crowd of commercials on 14 Mc. some Sunday mornings. Honk Kong overseas terminal can be heard testing with spots every 50 kc. from 14100 up to 14350 kc., and loud enough to wipe out VK9RH signals in the hook-up. Congratulations for the nice photo cover of "A.R." with four XYLs—their ranks are growing. Will soon have to hold their own "convention". Maybe I can get a cuppa from Muriel? 73, 4RW.

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SOUTH AUSTRALIA

The monthly general meeting for July of the VK5 Division was held in the clubrooms on South Terrace to a somewhat smaller gathering of members than is usual. The reason for the poorer than usual attendance is a bit hard to explain, certainly it was cold, but by no means as cold and unpleasant as it has been this month, and it can only be presumed that the name of the technical lecture for the evening scared a few away. The guest speaker was Mr. Metcalfe, and his subject that of Xerography, and in case you might be tempted to think that I have descended to the use of bad language, I will repeat, Xerography, which, for the benefit of the peasants such as myself, means Electrophotography. Now it is a peculiar fact, every once in a while we fluke the perfect lecture, the perfect lecturer, and the perfect subject, all of which adds up to a night of unexcelled entertainment, even though the subject is only remotely connected with our hobby of radio, and believe it or not, we always manage on these nights to have a smaller than usual attendance which is a matter of considerable loss to those who never turned up.

I would rate this lecture on Xerography as one of the best, if not the best, in all the years of our meeting nights, and no words of mine could ever do the lecturer or his subject full justice, or hope to convey on paper the intense and rapt attention of those members present during the entire one hour and a quarter's practical demonstration of this interesting subject. *Questions came* quick and fast at the conclusion, QSL cards, circuit diagrams, R.D. Contest log sheets, and a variety of material were photographed and copied on the spot with a rapidity that had to be seen to be believed, and the night was brought to a close with most of those present being in a somewhat spellbound condition. Brian 5TN proposed the vote of thanks to Mr. Metcalfe with a few well chosen words and the applause that greeted the lecturer must have been music to his ears, in fact his two assistants fairly blushed with pleasure. All in all a winner, and once again I must say that those who stayed home missed the meeting out of a box.

Very little business was transacted, either Federal or Divisional, although the President, Phil 5NN, with what definitely looked like a leer in my direction, announced that Council had tentatively booked a holiday house, Melville House to wit, in National Park, Belair, for the week-end of September 26 and 27, for the purpose of setting up an instruction-construction week-end on single sideband transmission and reception for any who might be interested. This is something new as far as VK5 is concerned and it will be interesting to see the interest and response displayed. Incidentally, it is proposed to build a transmitter at the camp and get it on the air on the Sunday at 1200 hours, and as this will be open house to visitors, the rest of the afternoon will be spent demonstrating s.s.b. DX, or that is what my instructions states. Remind me to set up my battery of Ford spark coils in opposition on 20 mx!

Quite a gathering of old timers noticed at the meeting. Roy 5DA (Buck to you), Tom 5TL, John 5KX and that handsome, debonair, and athletic type 5P?—oh well, perhaps I won't go on—my natural modesty has come to the fore!

Heard Len 5ZF and Leith 5LG having quite an interesting discussion as to why the plates of Leith's 807s were blushing with shame or mortification, I was not quite sure which. Leith remained quite unconvinced despite the obvious suggestions from Len and was apparently prepared for supernatural causes. Personally Leith, they reminded me of the old fire plug outside our once meeting place. Remember? Hi.

Len 5ZQ had his private grizzle—it appears that the "juice" had been turned off once or twice on a Sunday morning at his QTH, and he had been informed that it would be off again on the next Sunday—Leith, who signs the time book with the purveyors of the aforementioned "juice", suggested that one or two people in the vicinity of Len's QTH were not paying their bills and this was a method of finding out who they were, with a possible bad ending for Len, met with the reception it obviously deserved. In fact from the noise on Len's transmission he was performing a fandango in series parallel on the shack floor.

I did not include Harry 5MY in my list of oldtimers present at the meeting, mainly because he was dashing hither and thither scooping up the old shekels, and nobody would have believed me that he was an oldtimer, going on the agile and youthful manner in which he was racing around the floor. Bad luck he won that modulation tranny in a ballot—he has not been on c.w. since—in fact he has not been on—period.

Bob 5NW, according to my usual reliable informant, is in the throes of house building. You have my sympathy OM, I am in the throes of having the family castle re-decorated and re-furnished, to say nothing of knocked down and re-built, and that is enough for me. As fast as the water flows into the moat, the drawbridge breaks down and I have to empty the moat again to let the retainers return from the village. A frustrating cycle, I can assure you, to say nothing of the water rates.

The mentioning earlier of oldtimers reminds me that I heard two genuine oldtimers on 80 mx recently in Bob 5BG and Buck 5DA. Their little chat gave me quite a few nostalgic memories—real old Amateur Radio at its best. In fact I did not hear them mention once anything about the square root of the hypotenuse of the zero bias of the linear obtuse transistorised thingamybob. Quite a relief I can assure you!

Col 5CJ also heard on 80 mx recently. He seemed in good form and quite able to hold his own in any company. I was sorry to hear him say that his typewriter had broken down and can only hope it will soon be back in use. How subtle can I be Col.. Hope to hear from you soon! Now, take it easy.

By the way, did you cop the photo of the "Holier than thou's" on the front page of the magazine in July? No price was mentioned on their heads, but they would be lucky to bring two quid, including the bull. What was the biggest blow to me, as I looked at the photo through my dark glasses, was to see the way the VK3s and the VK5s were intermingling, and judging by the bemused looks on their faces, apparently enjoying it all. All my years of propaganda gone up in smoke—the only redeeming feature being that Pincott (3AFJ) was not present. I will bet he took the photo!! Another thing that upset me, two Comps 5EF in the photo—as if one is not enough! You don't believe me? OK, look at the fourth bloke from the left in the back row. It is listed as Les 3XM, but they don't fool me—I know these VK3s. Joking aside, it must have been a wonderful Convention at Hamilton, especially as it was not planned, it just happened. The only thing I have against it is that it was not an a.m. convention!! Confidentially, between you and me, it was the biggest blow to my morale since my XYL used my coherer for a salt shaker.

I had hardly posted last month's notes away when I received a letter from Uncle Tom 5TL, confirming the reported news that he was now down in the big smoke and was not residing at the Glandore Industrial Home, mainly because he was too old, or so he informed me. He is in the throes of getting back on the air and probably as this is being read is thumping the key and using the microphone, both together, trying to make up for lost time. Nice work Tom, what did you do with your cabin?

Brian 5CA displayed his recent purchase at the meeting, a pi coupler, with pardonable pride and enthusiasm, then left the room only to return and find the said recent purchase in the land of the missing. His efforts to find the missing purchase became so frantic that the guest speaker, Mr. Metcalfe, finally gave up in despair and suggested that if Brian was looking for an ash tray there was one on the end of the table!!! The pained and anguished face of Brian to hear his recent purchase described as an ashtray was worth coming miles to see, and having found his recent purchase he vanished into the night, no more to return.

Noticed in a popular magazine published in VK2, which will remain annomm—anomo—annonny—well anyway it will remain a secret, reference to the VK5 Division, including a list of the office holders. Preening myself and twisting the ends of my waxed moustache in anticipation of seeing for the first time my name and call sign in print in such an illustrious publication, I was cut to the quick, and other places, to note that no mention whatsoever was made to the Divisional Public Officer, the Custodian of the Instruments, the Publicity Officer, the Magazine Scribe, the Recipient of most of the Divisional Confessions, to say nothing of Odd Job Man and Chief Interrupter at General Meetings. I can only assume that I am a failure. Just think of it, Publicity Officer and could not manage to get my own name into print. Fie upon me. Some say "Good Old Pierce 2APQ"—"What do the mob say?" Come, come, let us not be coarse in our thoughts toward our fellow hobbyists.

Some time ago I commented in these notes that the VK5 official station 5WI must be something of a headache to the Council in view of the sad state of the 7 Mc. band, plus the uncertainty and somewhat lack of organisation being exhibited. A recognised axiom in this world is that if one criticses, one must also be prepared to praise, and with this in view I now have no hesitation in throwing around oodles of praise for the overall organisation and running of the session on Sunday these days. The praise of course must be equally shared by John 5LV, Brian 5TN and Gary 5ZK, and the number of stations participating in the callback is sufficient indication of the present popularity of the session. Nice work fellows, you may all take a bow.

Throughout VK there are several public spirited Amateurs who conduct Morse code classes on the air for the benefit of those who want to secure their license. We salute these chaps for their unselfishness, but we certainly do not salute the occasional dills who come up on their frequency and carry out their on-the-air tests to the detriment of the listener who is struggling to copy the code. It is all right for the QRM maker, he already has his ticket, but what about the trier who at times has to sit back and twiddle his thumbs until the QRM ceases. Personally I could not think of anything more frustrating, especially when a little thought on the part of the QRM maker could avoid the whole thing. Here's hoping the offender will check the frequency of these code classes and do the right thing. After all, most of it is only want of thought.

This month, in one way and another, has not been a good one for me. Returning from the place where I sign the time book with shaking hands, the other night The Board of Control informed me that a letter from VK3 had arrived for me that day. Checking it with great care for time bombs, red backed spiders, boa constrictors and other well known methods of extinction, I was amazed to find that it contained the annual report and balance sheet of the VK3 Division. Ah, I thought, at last deference is being paid to an ex-VK3 President (if only for a short while) and I lit the hurricane lamp in the sitting room and settled back on the kerosene case to indulge in a little light and pleasurable reading. My feelings of pleasure were soon dispelled as I noted with dismay that whoever was responsible for sending me the letter had gone to the trouble to underline with ink the name of Ken 3AFJ every time it appeared in print. Never in my life have I seen the same name bob up so often in a report. It was like the Scarlet Pimpernel. I saw him here, I saw him there, in fact I saw him everywhere, and the more I saw him the more my blood pressure rose. One statement I wish to refute, and I quote: "Ken Pincott, VK3AFJ, a member of 'A.R.' Committee and a Divisional Councillor, attended at his own expense, etc., etc." ad nauseam, ad nauseam. At his own expense is right. My information, from a reliable source, tells me that he rode a bike across to VK5 for the convention, and Joan and the Princess ran all the way across alongside him, carrying the luggage. Well, that's what I was told anyway. At his own expense all right. All he needed was enough hot air to keep the tyres pumped up! Oh dear, oh dear, why do they send me these letters?

A few years ago I went to live at Henley Beach and the first winter spent there was admitted by the local inhabitants to be the worst and roughtest winter ever experienced. One of the locals told me, with his tongue in his cheek, that this was due to the sea taking exception to the newcomers in the district and expressing its annoyance. Well, this winter has been one of the roughest for many years and the damage to the seafront has been terrific. So, with the above warning in my mind, I can only assume that the ex mayor of Lucindale, Arch 5XK, has at last settled in at the seaside resort of Semaphore. Now don't argue Arch, these local identities know what they are talking about, and the sea is certainly a good judge of human nature and has definitely excelled itself this time. And the same to you!

Noticed in the magazine, in the column of that old key-thumper Ray 3RJ. Oh yes, I read it now and again, what can one do during the long winter? that should cause him to do a Fandango on his sleeping bag. Anyway I noticed that Jim 2YC is making steady progress back to health again. Nice work Jim. I never had the pleasure of meeting you at any time during your terms of office for VK2, but your name was always synonymous for loyalty and hard work in the interests of our hobby in VK2. Take care of yourself OM.

Sneaked up to 80 mx the other evening to try and catch Jack 5LN and Athol 5LQ in QSO in search of some news, but like Mother

Hubbard, the cupboard was bare. Have learned since that they now frequent 1.8 Mc. The broadcast band next, I suppose. You will never get away from me, but keep off 5DN!!

I was that overcome last month to see the amount of space that VK5 is getting in the magazine that my conscience gave me a couple of severe twinges, and I have decided to write a couple of words less this month. [Quite obviously he cannot count above 10 unless he is barefoot!!—Ed.] Mind you, I should be getting the space—those boxes of cigarettes, those parcels of dressed poultry, to say nothing of the eggs and pork that I have been sending over each month to Ye Ed have certainly cost me plenty. However, it is worth it for the Division, although I could not help but think that his "Wot no cheese?" in his last letter was laying it on a bit thick. After all, when the chassis-giver-awayer (Ron 3RN) was Ye Ed, he used to be satisfied with an occasional new motor car or so. OK, OK, you know what you can do with your annual supply of noughts, even if it does not make me the highest paid contributor to the magazine, see if I care.

73, de 5PS—PanSy to you—not you Pincott.

— . . . —

WESTERN AUSTRALIA

Here we are again in an attempt to compile some notes out of very little news. Everyone must realise that if you want notes to appear in "A.R." information must be passed on to your scribe.

We must begin with some information which has been passed along and could be of interest to someone. We learn that two Amateurs, namely 6ZDW and 6ZBK parked their cars in a well known parking area and what do you think happened. Doug locked his keys in his car and although Peter had his keys he could not unlock his doors. They then decided that Tom 6DP lived over the road and decided that they would get in touch with him and from here they called the people who advertise "Reach for the Phone and not the wrench." The idea being one was a member but you can guess the rest.

How long ago did we lose the lower two megacycles of the 6 metre band? This is a question that could be well asked by Alyn 6ZDM, as he could not receive the beacon on 52.030 Mc. and blamed his converter for not working. Poor Alyn, he was still tuning from 50 to 52 Mc., hopeful of hearing signals.

Something more of interest to those of other States. Bert 5ZDV is busy modifying a 522 to work on the VK3 f.m. net and is hopeful of journeying through that State later in the year.

At our last meeting we had a very distinguished visitor from Kalgoorlie, 6DX. If you want to have your meetings livened up, all you need to do is invite Bill along. His ability at vocal expression and command of the English language leaves nothing to the imagination. This includes Australian expression also.

It is just as well that Alyn, our Secretary, has had the phone installed in his residence because it could have become embarrassing to the Institute if someone had realised that the body with a kitchen chair in the public phone box belonged to the VK6 Division. Of course the chair was necessary for two reasons. (1) Alyn is carrying a lot of weight these days; (2) If you can stop him from talking, let us know how!

The Youth Radio Scheme is progressing in this State with the formation of a group at Modern School and Henry 6DC forming a group at Applecross. This scheme is a very commendable one and anyone who can assist anywhere should contact Laurie 6ZEA and he will use you somewhere in the scheme.

By this time the Remembrance Day Contest will be over and we wonder who was successful. Can you read this and know that you helped this State by submitting a log?

Remember that your Council wants to help you and the Division so if you have any queries, information or complaints bring them along to them.

Seems that this uses up all information to hand this month, so what about passing some along for next month. 73, 8RY.

— . . . —

TASMANIA

Once again our Remembrance Day has come and gone. Hope you all enjoyed the week-end and did your share towards helping your Division. Remember though, your participation doesn't help us one bit if you don't get that log away to F.C.C. on time. So if you have not sent it off yet, what about doing it pronto?

Another of the fraternity is deserting VK7. Our North-West coaster, Basil 7BL, sets sail for a place called Spirit River (don't know what kind of spirit) in Alberta, VE land, on 14th August. One thing about it, after this winter in the "ABC" Isle, he should be acclimatised for a white Christmas. Anyway Basil, we'll miss you here, but we certainly wish you and yours everything you could wish yourself in your new QTH. No doubt we will hear you on the bands at some future date.

At the July V.h.f. meeting we were privileged to see a film (by courtesy of 7YY) called "Compact". This film I understand is "doing the rounds" of all Divisions and if it has not come your way already, I strongly urge you to see it. Most interesting and informative was the general opinion here.

Ted 7EarBasher is not so good at time of writing, but we all hope he will soon be all right again with no complications after a bout of the mumps. (That's a kids' complaint—must be in his second childhood!)

Bob 7OM is interstate in VK4 capital and will be there till early October. Ian 7ZZ and son John are planning three weeks in VK5 from 25th August—going over for his Dad's 70th birthday. Congratulations and many more returns, Mr. Nichols.

Our general meeting lecture for August was given by Len 7LE and was the postponed July lecture on "Predictable Long Distance Radio Communication via the Satellite Ionisation Phenomena," and as is usual with one of Len's lectures, it was delivered with illustrations and thoroughness.

The question is often asked, "What constitutes an active Amateur?" A builder and experimenter, or a rag chewer who pounds the ether at every available opportunity? And I know there are two very divided schools of thought on the matter, but I think all would agree that an Amateur such as Len, who has studied this phenomena almost daily (except for a few unfortunate and brief periods) since the first Sputnik went up in 1958, yet only very occasionally puts a signal on the air, is a very active Amateur indeed—possibly one of a handful of persons in the world doing such work. Good luck, Len, with this and future efforts you get into.

Believe we are to have a visit from Barry 5BS during the September school holidays. Hope you meet up with a goodly number of us over here Barry. Also Arthur ZL3RE will be here and staying with Keith 7RX for three weeks starting November 1.

Gerhard 7GK is now active with a good c.w. signal, mainly on 20, but came back to Ian 7ZZ after the broadcast on 40 the other week-end.

Another signal heard by someone was 7DB, who popped up on 147.3 Mc. after a silence of 14 years. Could be some others about too before long—that's if they pass the Sept. exam. Three I know who are sitting are Barry Riddell, Robert Geeves from Southern Zone, and Bruce Kelly from N.W. Zone. Good luck chaps and hope the answers come easily to you. 73, 7ZAS.

NORTHERN ZONE

There was a poorer than usual attendance at the last meeting, the total being 15 which included two visitors, Dave 7ZAY and David Clayton. We hope you will both become Zone members. Unfortunately the taped lectures did not arrive for this meeting.

Ray 7RK is recovering from his recent operation and will, we hope, be back to normal soon. Norm 7ZRG was heard on the bands after having returned from VK3. He also announced his wedding in the not-to-distant future. Congratulations to you and your XYL-to-be, Norm, from the Zone. A new station, 7ZGP, is now active on 2 mx, mainly at week-ends. 73, Leigh Pretty.

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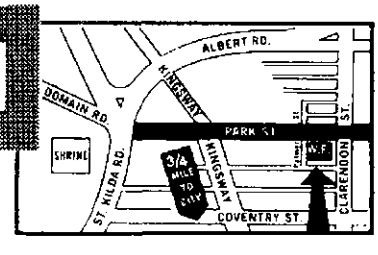

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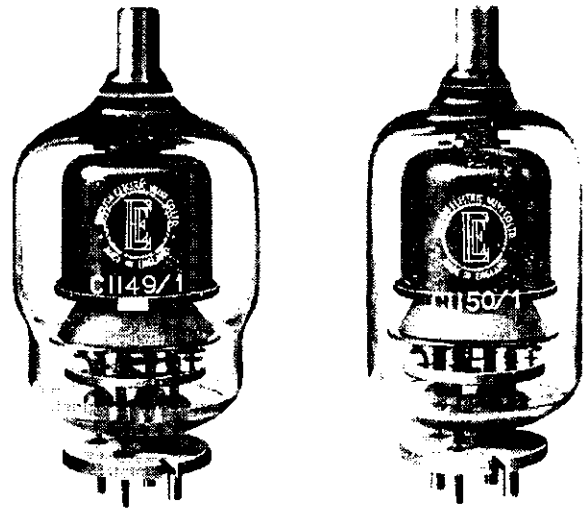

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Heater Voltage	26	26	V
Heater Current	2.15	2.15	A
Cathode Heating Time (Min.)	3.0	3.0	minutes
Mechanical			
Overall Length (max.)	6.00	6.00	inches
Overall Diameter (max.)	3.062	2.598	inches
Base	B4A	B4A	
Mounting position	Any	Any	

TYPICAL OPERATING CONDITIONS

	C1149/1	C1150/1	
Duty Cycle	0.001	0.001	
Pulse Length	2.0	2.0	μ sec
Anode Voltage	20	15	kV
Screen Voltage	1.25	1.25	kV
Grid Voltage	—600	—600	V
Pulse Positive Grid Voltage	150	100	V
Pulse Anode Current	18	15	A
Pulse Screen Current Approx.	1.7	2.0	A
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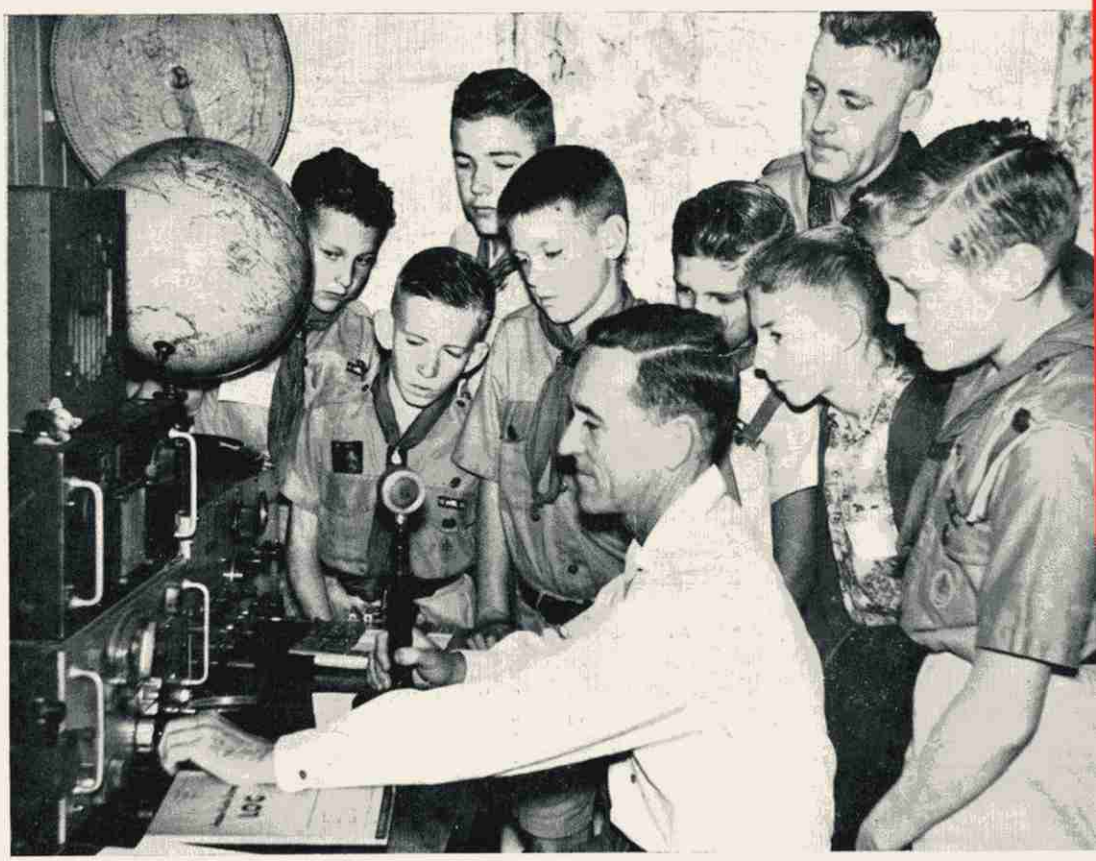

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★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o. P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

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OUR COVER

Gympie (Q'land) Scouts, who contacted 57 stations in the 1963 Jamboree-on-the-Air.

Block by courtesy of "Gympie Times."

FEDERAL COMMENT

★

In Amateur circles, the various months of the year have begun to assume new meanings—for instance, February has become N.F.D. month, August is R.D. month, April is Federal Convention month, October is VK-ZL Contest month, and so on. More recently October has become associated with the Jamboree-on-the-Air as well as the DX Contest.

For those unfamiliar with the term "Jamboree-on-the-Air", it is a radio get-together of Scouts from all over the world—a radio campfire in which any Amateur, whether a Scout or not, may participate. The article in last month's journal gives fuller details of the origin, objects and rules. One of the objects was "to introduce them (the Scouts) to Amateur Radio and Electronics". It is the theme of this object on which we would like to enlarge.

Those Amateurs who in past Radio Jamborees have had young Scouts to their shacks and conducted contacts with other stations where Scouts were also present, will confirm the pleasure and interest shown by this younger generation in Amateur Radio as a hobby. Although one of the tests for a Scout Badge is a Morse Code test, it is very, very rarely that this test is ever put to use. A Scout who is able to take part in a QSO over the radio will be keener than ever to launch out into something beyond the normal Badge test.

The intense interest shown by Scouts and their parents who visited the W.I.A. Amateur Station at the Wonga Park Pan-Pacific Jamboree a few years ago indicated that here was a ready source of budding Amateurs. Unlike the High School Radio Scheme, which is now functioning in nearly all States and rapidly making great strides with the younger generation, a similar approach in the Scouting field has never been attempted.

The coming Jamboree-on-the-Air therefore provides an ideal opportunity to Amateurs to present our hobby to another section of the community who may well retain their initial interest and keenness and proceed to the next step—becoming a licensed Amateur. Another Pan-Pacific Jamboree is planned for the near future and Executive have already been invited to participate by providing an Amateur Station as before.

The Jamboree-on-the-Air scheduled for the 17th-18th of this month will enable a large number of active Amateurs to invite local Scout Troops to their shacks and participate in friendly QSOs with other troops in other parts of Australia and overseas. Contact your local Divisional Organiser who will be only too happy to assist. The small effort involved will be found to be richly rewarding and promote the spirit of Scouting in having done your "good deed for the day".

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

MULLARD PREFERRED RANGE OF DIODES

For Entertainment Applications in Australia

When approaching the maximum limiting values, either electrically or thermally, the comprehensive data and curves, as contained in Volume 4 of the Mullard Technical Handbook, should be consulted.

Type Number	Description and Application	Max PIV (V)	I_{FM} (mA)	$I_{F(AV)}$ (mA)	$I_{F(surge)}$ (A)	T_{amb} max (°C)	Outlines and Dimensions
AA119 2-AA119	AM/FM detector diode	45	100	15	0·2	60	SO-6
BA100	General purpose, small-signal silicon diode	60	100	90	0·2	90	SO-6
BA114	General purpose, small-signal silicon diode suitable for voltage stabilisation	—	—	20	—	90	SO-6
BA122	General purpose, small-signal silicon diode suitable for AFC	100	100	90	0·2	90	SO-6
BY100	Silicon junction power rectifier	800	5A	450	55 ■	70	SO-16
OA90	Sub-miniature HF detector diode	30	45	10	0·2	75	SO-6
OA91	Sub-miniature high-voltage general purpose diode	115	150	50	0·5	75	SO-6
OA95	Sub-miniature high-voltage general purpose diode	115	150	50	0·5	75	SO-6
OA200	General purpose, small-signal silicon diode	50	250	160	—	125	SO-6
OA210	Silicon junction power rectifier	400	5A	500	25	70	SO-16
OA605	Silicon junction, low current medium power rectifier	50	5A	500	25	70	SO-16
OA610	Silicon junction, low current medium power rectifier	100	5A	500	25	70	SO-16
OA620	Silicon junction, low current medium power rectifier	200	5A	500	25	70	SO-16
OA630	Silicon junction, low current medium power rectifier	300	5A	500	25	70	SO-16
OA650	Silicon junction power rectifier	500	5A	500	25	70	SO-16
OA660	Silicon junction power rectifier	600	5A	500	25	70	SO-16
OA670	Silicon junction power rectifier	700	5A	500	25	70	SO-16
OA675	Compensation diode for Class 'B' output stages	1 ●	10	—	—	75	TO-1

■ sine wave = 10msec

● although the reverse break-down voltage is normally much higher than 1V, this device is not intended to be used in the reverse direction

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GETTING STARTED ON 160 METRES

PART TWO

RODNEY D. CHAMPNESS, VK3UG*

IN the first article ("A.R." Aug. '64) a small transmitter for 160 metres was described. In this article an adaptation of the transmitter is described, combined with a few other general ideas that may help you to get started on this band.

THE ANTENNA

Aerials for this band can be a real headache on a suburban block. A normal half-wave dipole will stretch out to a length of 250 feet, and as many suburban blocks are only in the vicinity of 100 feet long, half-wave dipoles are out. It is felt in general amongst Melbourne Amateurs on this band that a quarter-wave Marconi is perhaps the easiest to instal.

My own aerial is a folded quarter-wave, made out of slotted 300 ohm t.v. ribbon. By using a folded type aerial the fed impedance is increased, resulting in lower ground losses, therefore higher radiation efficiency. The earthing system of my aerial consists of the mains earth and also a 130 feet length of insulated wire as a counterpoise (65 feet of 23/.0076 twin flex split in two, laid alongside the building around some trees under a lawn and along the front fence.

The folded radiator is up as high as I can get it at 25 feet. The first 25 feet is vertical and the rest is horizontal. Another advantage with this aerial is the fact that the velocity factor of the twin ribbon is between 0.85 and 0.9, resulting in the aerial being about 110 to 115 feet long instead of 125 feet or thereabouts. This aerial is described in detail in William Orr's book, "S-9 Signals", which I would recommend.

Fig. 1 should give you an idea what the aerial is like. I might add my location is a difficult one for communication, and this is the best aerial I have found to date for this band.

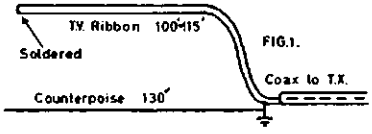


FIG.1.

RECEIVERS

Now to receivers. An ordinary broadcast mantel set is quite suitable to modify for 160 metre work. The information on how to modify a b.c. set's tuning range is covered in April "A.R." The information is in the s.w.l. section on page 14. If you are going to do this, I would recommend using a sensitive 5-valve set and nothing less as signals are nowhere near broadcast station strength. I have not tried this conversion myself, but the results with a good set will be satisfactory. For some time I did conversions to similar sets for the purpose of monitoring mobile bushfire radios on a frequency of 2692 kc. These sets were able to receive mobiles up to 50-60 miles. The mobiles run powers of 7-10 watts and use 9-foot loaded whips. Base stations were heard at distances of a 100 miles or so. These were day-time ranges.

An interesting and economical point about the transmitter described in the previous article is that it can be teamed with an ordinary b.c. set. Using the power from the set, it will run about 5 watts providing the high tension voltage is above 220 volts. The extra loading on the receiver power supply heater line can be largely offset by removing the dial lamps or replacing them with lower wattage types. The high tension drain of the transmitter is approximately the same as the receiver high tension drain.

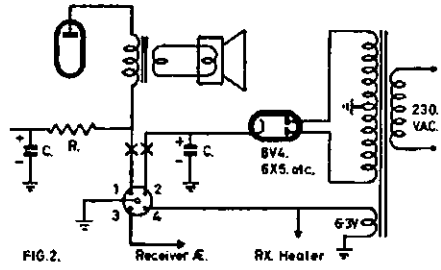


FIG.2.

The modifications to the receiver and transmitter can easily be worked out by studying the accompanying diagrams. Most receivers use a resistance-capacitance filter network in the high tension line. The plate lead of the audio output valve usually comes off the first filter capacitor. The point to break the circuit is at the junction of the first filter capacitor, the dropping resistor and the speaker transformer primary lead. The capacitor is left connected to the rectifier cathode.

A lead is soldered to this capacitor and taken to a pin on the chassis mounted 5-pin miniature socket. Another lead is soldered from the junction of the dropping resistor and the speaker transformer primary lead to another pin on the socket. An earthed lead goes to a pin on the socket. A lead from the receiver aerial goes to another pin on the socket. The remaining pin is wired to the active 6.3 volt heater line, which is easily traced from the dial lamp sockets. Should the receiver require to be used without the transmitter connected, a shorting link across the two h.t. leads will do the trick.

There are of course numerous modifications that can be done to a broadcast receiver. To further cut down the receiver heater drain, the replacement of the rectifier valve with a pair of OA211 silicon diodes is recommended. HR25s or OA210s, etc., can be used in this position if two of them are used in series in each lead. Equalising resistors and capacitors would be advisable across each diode. The value of the capacitor should be about 0.001 μF. and the resistor 100K ohms $\frac{1}{2}$ watt.

Quite a number of receivers use 6M5s or similar as the audio output. By replacing these with a 6BM8, 6AB8 or 6GW8, using the pentode section as the audio output, a spare triode section is available which could be used as a b.f.o., and with no increase in overall current drain in the set. An increase in the bias on the audio output valve won't unduly effect the volume and at the same time a significant saving in high tension current will be achieved.

Now turning to the radio frequency sections. The i.f. valve might be replaced, particularly if it is one of the lower gain types such as a 6U7G, 6K7, 6AD8, etc. A 6BA6 or EF50 could boost the sensitivity quite noticeably. The i.f. may, however, take off, so neutralisation may be necessary. This is accomplished by putting a 5-10 pF. mica capacitor from the plate of the valve to the top of the a.v.c. capacitor. The a.v.c. capacitor will usually have to be reduced to 0.01 μF. for the neutralising to be effective. A small plate may need to be soldered across the valve socket to separate the grid from the plate as much as posisble.

Another thought for sharpening the i.f. is to fit two Philips i.f. transformers coupled as per Fig. 4 between stages. The value of C1 governs the degree of coupling between transformers and consequently selectivity. The larger the value the higher the coupling and gain. Compared with the normal two i.f. transformer set-up, this has lower gain so the substitution of a really "hot" valve would be necessary. A couple of suggestions here would be a 6AC7 or 6EH7. Isolation between the input and output would need to be good, otherwise it would really "take off". Re-arrangement of the components to achieve this isolation may be required plus a shield soldered across the valve socket, shielding the input and output would be a must. This shield must of course be earthed to the chassis.

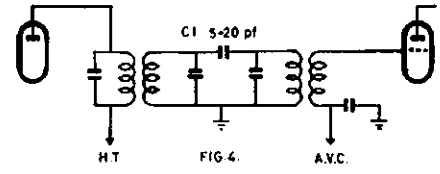


FIG.4.

The front-end could also be given a pep up. A converter using some of the older octal tubes might be replaced with the likes of a 6AE8, 6AN7A, 6BA7, or similar. Some of the t.v. tuner type converter valves such as the 6EA8, 6BL8, 6U8 might also be tried, but care would be needed if a.v.c. is applied to this stage to be sure that the oscillator was not detuned by variations in a.v.c. voltage. Experimentation with the method of signal injection would be needed.

The aerial coil could come in for some attention. If a resonant aerial is used a low impedance aerial coil primary would be desirable. This would consist of a few turns, up to a dozen, wound near the tuned winding. Of course if a non-resonant short aerial is to be used this would be an undesir-

* 5 Princes Street, St. Kilda, Vic.

able modification due to the high impedance of the short aerial already matching the impedance of the aerial coil primary.

As can be seen from Figs. 2 and 3, the modifications to the receiver to run the transmitter are minor, and the alterations to the transmitter described in Part One are fairly minor. There are only a couple of things for comment in the amended transmitter control. The first is the relay supply system. This is a voltage doubler circuit designed to give 12 volts for the relay from the 6-volt supply. The value for C3 should not be decreased below the value stated as its reactance would be too high, causing less than the 12 volts to be developed. The other is the value of C1. This should be kept as low in value as is consistent with low hum and no motor-boating. If this is too large, a squeal will most likely be heard on the changeover from transmit to receive or vice-versa.

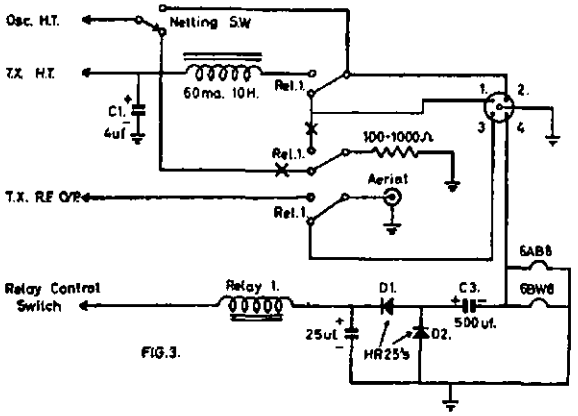


FIG.3.

If this cannot be overcome and you have a spare set of changeover contacts on the relay, they can be arranged to short out the high tension line of the section not operating at the time. This should be a short through a low value resistor, and not a direct short, or you will find the relay contacts rather burnt after a time of operation. These changeover contacts for the shorting are shown already in Fig. 3 and are the ones with the "X" in the leads to them. Of course this can be left out if yours is only a d.p.d.t. relay, and in any case they may not be required, depending on the particular set.

GENERAL COMMENTS

Well that has described the equipment. Simple isn't it? 160 metres is the easiest band to get on without exception. It is an ideal band on which to try antenna experiments. Small aerials do work, I believe that some of the chaps are working on some shortened 160 metre aerials, results and descriptions I believe are to be put in "A.R."

As yet I haven't tried mobile work on this band. John VK3AFU has tried mobile operation and the results he has obtained have been most encouraging. Range in excess of 25 miles with no fading or skip are being achieved regularly. Mobiles for this band would be simple to build. A transmitter similar to the one described in August, teamed with a car radio, would be an ideal set-up. The car radio could be altered as per the ways mentioned for mantel sets. If an old vibrator type car radio could be obtained, so much the better. The vibrator power supply could be made to supply the high tension for the transmitter in much the same way as described for modifying mantel sets. The aerial coil in the car radio, if it is to be used solely for 160 metre work, should be removed and replaced with a coil with a low impedance primary winding. An ordinary broadcast band coil could be suitable with the slug wound out or a few turns removed from the secondary winding. As these are wound with Litz wire, be careful to solder all strands.

One interesting thing about mobile on this band is the simple methods that are effective in suppressing the ignition noise. The usual coil and generator by-pass capacitors and the suppressor resistor in the coil h.t. line will, in most cases, make the vehicle "quiet". A suppressor in the coil h.t. line should only be put in where normal wire cored h.t. line is used. Where radio resistance cables are used, no suppressor is needed in this lead. For more elaborate suppression methods, should they prove necessary, the A.R.R.L. Mobile Manual and the "CQ" New Mobile Manual are recommended.

Results on this band are good, signals are heard from VK2-3-4-5-7 and many of these have been worked on low power both by myself and others. Trans-Tasman isn't unknown. The ZL allocation isn't the same as here, being 1875-1900 kilocycles.

Well chaps what about it? Dig out those old receivers, soldering iron and a few bits and pieces and get yourself started on this first class band. I hope I'll have the pleasure of working you soon on 160 metres! ●

AMATEUR FREQUENCIES:
USE THEM OR LOSE THEM!

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

SOME NOTES ABOUT STORAGE BATTERIES

WNG.-CDR. C. G. HARVEY, R.A.A.F., VK1AU*

HOW many Amateurs remember that a car battery is not only an electrical device, but also a chemical contrivance? In its common lead acid form it consists of cells, each comprising positive and negative plates immersed in a solution of sulphuric acid and water. The plates are made by pasting oxides of lead into a lead alloy framework. They become active when the first "forming" charge is given to the battery in the factory, when the active material in the positive framework turns into lead peroxide, and that in the negative frame becomes more porous and spongy. Both "plates" are reasonably porous so that the electrolyte can penetrate.

As long as the battery remains fully charged, the sulphuric acid component of the electrolyte stays with its companion water outside the plates.

As the battery discharges, the acid leaves its water, and penetrates the active material of the plate, forming a temporary lead sulphate. When the battery is fully discharged, most of the acid has left the electrolyte so that a measurement of its specific gravity would show that it was mostly water, whose hydrometer reading would be 1.000.

You can see that it is active material in the plates that represents battery power, released by the flow of sulphuric acid during discharge. Shedding of this active material from the plates, whether due to bad design, shoddy manufacture, or electrical, mechanical or chemical abuse, will cause a loss of power. Reputable manufacturers go to considerable trouble to produce a plate in which the active material is locked, so as to resist the shedding caused by gas bubbles and mechanical expansion. The object is solely to retain the material in the plates and not at the bottom of the case, for as long as possible, for when shedding occurs the days of the cell are numbered.

Just as one shoe often wears out before the other, so often will one cell in a battery prematurely fail. The cause of shortened life is not hard to find. Although most cases of failure are chemical, some are mechanical, causing internal shorts or high internal resistance.

By far the most common cause of premature failure is unintentional abuse through lack of proper care. Lead sulphate formed in normal useage is readily removed by regular charging, however, leave the plates stand in a discharged condition or continue to operate a partly discharged battery, and the sulphate becomes harder, denser and eventually crystalline.

An area of hard sulphate cannot be removed by charging, with the result that the whole of the active area of the plates is no longer available, and your battery's capacity is reduced, permanently.

* 16 Lynch Street, Hughes, A.C.T.

Another common cause of permanent damage arises from overcharging, which by producing heat and violent gassing evaporates water, and so exposes the tops of the plates. Exposure alters the chemical structure of the tops of the plates which never return to their original state, even if water is subsequently added. This area now acts in such a way as to attempt to discharge the remainder of the affected plates and ultimately the battery will fail to hold its charge for long and is then usually credited with being "worn out" prematurely.

Heat needs to be watched for two reasons. Firstly, high temperatures tend to soften active material, particularly when the electrolyte specific gravity is high. The gassing which occurs towards the end of the charge is then able to erode this relatively vital component easily. Most manufacturers therefore recommend about 110°F. as the maximum temperature during charging.

Another problem with heat concerns the accuracy of measurement of specific gravity. Battery electrolyte strengths are usually specified as being taken at 70°F. Any variation from this temperature requires that the hydrometer be corrected by 0.001 for each 2½ degree temperature difference from standard. Thus on a hot day, the electrolyte is "stronger" than the hydrometer shows.

Theoretically, VK7s should find a fully charged battery reads about 1.250 whilst our Capricornian VK4 friends should measure values of only about 1.220.

Looking at it another way, a 20 degree temperature rise will tickle up a partly discharged battery as much as an overnight 1 amp. charge!

BATTERY CAPACITY AND DISCHARGE RATES

It is sometimes assumed that measuring the specific gravity of a battery is the only scientific way to establish its condition. This is only partly true, and can be misleading unless it is also recognised that the battery's capacity for work can only be established by electrical means. To recapitulate, the principal cause of premature old age in a battery is loss of active material on area in the plates, either by shedding or by being covered by hard sulphate.

There is also a secondary cause, oxidisation of the grid framework of the positive plates. This is brought about by the decomposition of the water in the electrolyte during charge, into oxygen and hydrogen. Oxygen is now the villain of the piece, as apart from creating an explosion hazard, the hydrogen is harmless. The excess oxygen causes the positive plate framework to rust away relatively quickly and is a frequent cause of batteries wearing out.

Now, any discharged battery, whether "worn-out" or only in a low state of charge will register a low value on a hydrometer (because the acid in the electrolyte has gone into the plates). The fact that the specific gravity will again rise during charge simply means that some acid has been returned to the electrolyte.

However, note that if half the area of the plates in a battery were affected by fixed hard sulphate, they would for all practical purposes be "dead", and despite an increase in specific gravity reading after charge, the battery capacity would be no more than half its original capability.

Consequently, unless of adequate capacity originally, it might now be unable to do its normal job of starting a stiff engine properly.

One method of checking an ageing or suspect battery is to allow the battery to stand for 24 hours after a full charge. If its SG drops more than 10 points, it's reasonable to assume the battery is not going to hold its charge long.

This method is time consuming and can be confused by temperature changes, so it is now more usual to apply a high discharge rate electrical test which will show the voltage to which the battery drops under normal heavy load.

As there is much confusion about battery ratings, it is important to realise that a 100 ampere hour battery will not deliver 100 amps. for one hour; in fact, it would not even give 50 amps. for 2 hours before its terminal voltage dropped drastically.

This is because the actual capacity of the battery is not a constant, but varies considerably with the rate of discharge. The capacity given for most batteries is the number of ampere hours available from a fully charged battery, which is discharged to a stated voltage, at a uniform rate over 20 hours.

Thus a 100 ampere hour battery will generally give only 5 amperes for 20 hours. This discharge rate would bring a 12 volt battery steadily down to 10½ volts in 20 hours.

Sometimes a rating for 10 hours is given and in this case a 100 A.H. battery would supply only 10 amperes for 10 hours.

Note, however, that sometimes a battery is also given a "cranking rating," which is a short term rating such as 100 amps. for 20 minutes, during which the voltage would drop to 9.

Obviously then, for mobile or field day activities, discharge rates in excess of 10 amps. demand adequate amp. hour ratings and re-charging facilities.

To recharge a battery to its original rating will require about 20% more ampere hours than have been taken out of it, but surprisingly enough, the high discharge rate incurred in starting engines and dynamotors are less troublesome in respect of battery life than prolonged useage of lamps and power supplies, etc., which regularly discharge the battery to very low voltages.

This is because a start taking say 200 amperes and occupying 3 seconds

amounts to only one-sixth of an ampere hour. This can be replaced by the average automotive generator in about 1 minute; allowing for losses, it should be possible in daylight running to put 2 ampere hours back into a battery in about 12 minutes running.

Reputable battery manufacturers say that wear and tear on a starter battery is not brought about by high discharge rates, but by the often haphazard recharge used to restore the battery to its fully charged state. They claim that good batteries can be discharged at the greatest rate the associated cables will stand without damage and that even at these rates, recuperation will occur rapidly providing the maximum rates are applied intermittently.

The reason for this is that a battery is protected when subjected to a near short circuit because the acid cannot diffuse into the plates quickly enough to maintain a very high rate of discharge. Additionally, soft sulphate immediately forms, increasing the internal resistance of the cell, thereby restricting the current flow to safe values.

On the other hand, long slow discharge rates denude the electrolyte of all its acid, allowing lead hydrate to permeate the pores of the plates and separators, leaving sulphate coatings which can be very difficult if not impossible to eradicate.

Perhaps Grandpa's "old blooper", with its 201As, horn speaker and all, had the right idea, as an essential component on nearly every radio table in the thirties was an "A" battery and a trickle charger.

SOME COMMON FALLACIES

"Never make a practice of operating the starter with headlamps burning at the same time," so goes the instruction in some car handbooks, usually with the pious statement that "this puts too great a strain on the accumulator." To quote a well known battery maker, "Who says so?" Examination of the appropriate curves will soon show that an increase in discharge rate from 100 to 110 amps only drops the terminal volts a tenth of a volt! and guess what, it's the same at 200 amps—if your battery hasn't been poisoned by sulphate and neglect!

"Boiled water is just as good as distilled water." Don't you believe it. The effect of boiling is to concentrate the impurities. For instance, if a water sample originally contained 3 parts chlorine to 100,000, and it was boiled until half the sample had evaporated, guess what—the residue would contain 6 parts!

Remember that no source of natural water can be given a permanent certificate of purity, and that in some communities one must be on guard for periodical chemical treatment of the town water supply! For that matter, it is not unknown for analyses of distilled water to show contamination, often by chlorine. Clean pure water is infinitely preferable to **impure** distilled water, but in the absence of an analysis, beter stick to a reliable commercial brand of distilled water.

"How Often Should The Acid Be Renewed?"

It seems impossible for some people to credit that sulphuric acid does not weaken or lose virtue by ageing, and that it does not evaporate. Thus the maker's instructions say clearly, **add clean pure water only, never acid.**

"This Battery Will Not Sulphate"

If any lead acid battery is tested during discharge, it will be found that there is a gradual drop in the specific gravity of the acid. If this is so, where has the acid gone to? It has gone into the plates, but it has only done so by combining with the active material as lead sulphate. Thus if there is no sulphation, the cell cannot function.

"When Charging It Is Necessary To Keep The Current Constant"

Not so. Up to the gassing point, and about 110°F., the rate is practically immaterial. After that, it is necessary to keep the rate down to minimise "shedding", caused by convection and violent gassing.

"A Battery Is Short Circuited When Submerged In Water"

Not necessarily so. Absolutely pure water is an excellent insulator. Even when impurities are added to river water, the resistance across the battery terminals would be much too high to affect its performance. The specific gravity of the electrolyte is heavier than that of the water so that there would be no immediate diffusion of the river water into the electrolyte. Foxes in all States, bar VK3†, take note! ●

† The Maribyrnong River is believed to have concealed at least one Fox's Battery in recent years.

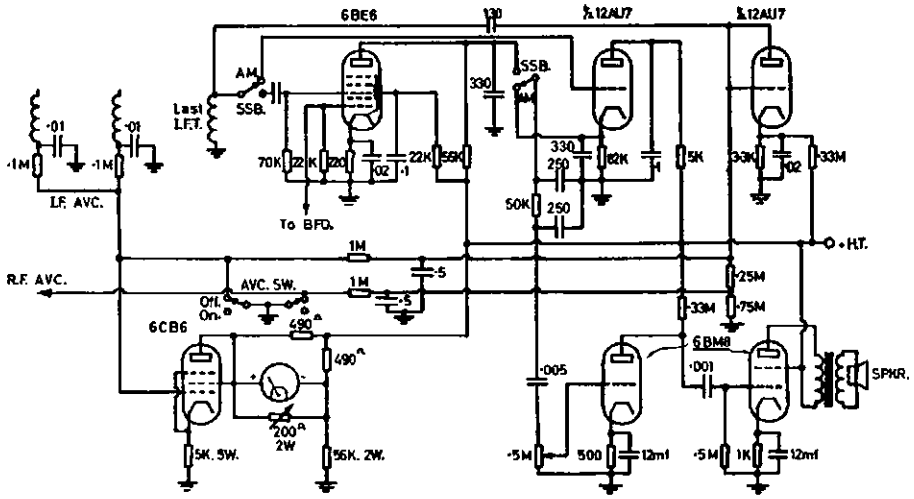
Modifications to the AR7

H. A. BEHENNA, VK5BB*

ALWAYS wanting a second receiver, and one that lent itself kindly to experiments, I was fortunate to procure an AR7 fairly cheaply. Not wishing to alter the original receiver, and with interest mounting toward s.s.b., this looked the answer to it all.

The AR7, much modified on purchase, looked OK, but on being switched on was certainly a doubtful quantity.

With the aid of the scope iron all was removed back to the second r.f. stage. Starting with the converter, this



was changed to a 6AE8, being slightly better than the 6K8. Next, a strip of the original chassis was removed, which previously held the i.f. sockets, etc., and a new piece of aluminium holding the second r.f. (12AU7) and the 6BE6 was re-bolted over the hole caused by the said strip, being removed.

A suitable socket was placed in the original power input hole to take the leads from the power supply which was kept exterior.

The 6U7s were changed to EF39s, both in the r.f. and i.f. stages, and the circuitry wired. The 6BE6 acting as the product detector, half the 12AU7 as the infinite impedance detector, the other half as the a.v.c. amplifier. The 6CB6 as a triode and S meter tube and the audio driver and output a 6BM8. You will find plenty of space left to locate the 6C4 b.f.o.

Upon switching on I found it worked first up and apart from the odd dry joint, etc., and adjustment of the S meter, we were in business.

When I say it worked, I must admit that considerable time was spent on the product detector input voltages, to get the s.s.b. sounding right. Having the second receiver, I decided to go for the bandspread, so very helpful with the reception of sideband.

I do not use an antenna trimmer because of the very narrow tuning range.

The s.s.b.-a.m. switch is located in the noise-limiter hole.

Should you have one of these receivers or any other type that can be bandspread, then I urge you to try this out, especially if your main receiver has no product detector. You will be surprised and mighty happy. When someone on s.s.b. calls you, you will know just what they are saying.

I have left the b.f.o. circuit out of the diagram, you can suit yourself here.

Please yourself on tube types, because the ones I used I had in the drawer.

Individual circuitry for each stage is standard and can be found in most issues of any good handbook.

Oscillator and b.f.o. are fed from voltage control tube, and a noise limiter is to be added later. ●

* 14 Stanley St., Crystal Brook, South Australia.

☆

OPTIMISM

There is a peculiarity of man's mental make-up which makes him very prone to give himself the benefit of the doubt, when something he wants to do is in question. The fish that got away is always the largest, the 90 miles per hour might just as easily be due to a rather favourable speedometer as to the actual performance, and so on.

Short wave reception is something like that. Everybody at some time or another, who has listened in on short wave has heard a distant station at good strength. He has been thrilled to the teeth over an unexpected purple patch which he struck at 2 a.m. when all sane people were in bed and snoring. He has emerged triumphant, after an hour's frenzied listening, with the call sign of an elusive foreigner.

Next time you meet him, he is full of the tale—how he received the particular station at full speaker strength, loud enough to wake the house, and the quality! Just like a local.

What he means, of course, is that he brought in some static, a fair amount of fading, and so on, but undeniably he did bring in the station. He badly wanted it to be equal in every way to a local, and his natural enthusiasm brought him very near to his objective. This was not deception—it was merely a little optimism.

There is no harm in it at all, except for the dis-service it is apt to render, S.w.l'ing as a whole.

When QSL'ing, always send an honest report, as much detail as possible, be brief and to the point. It is as easy as that.

—Chas. Abernethy, L2211.

MORSE CODE PRACTICE

The New South Wales Division of the Wireless Institute of Australia provide a comprehensive service for Morse practice. Apart from the nightly Morse Practice Sessions on (approx.) 3550 kc. commencing at 7.30 p.m. E.A.S.T. at 5 w.p.m. and finishing at 8.15 p.m. at 16 w.p.m., there is the Morse Tape Service, which has proved very helpful to those who own or have access to a Tape Recorder. Since the C.w. Tape Service was started early in 1963, 580 hours of Morse on Tape has been sent out to interested parties. Figures at the end of last month were—

New South Wales	284	hours
Victoria	115	„
Queensland	81	„
South Australia	27	„
Western Australia	16	„
Tasmania	10	„
A.C.T.	17	„
New Guinea	30	„
Total hours of Morse Distributed	580	

Included in this total is 199 hours copied on to "Customer's Own Tapes". The majority of it on to 3-inch reels recorded at 1⅞ i.p.s. Radio Clubs find it better to own and keep their own tapes. Now Morse has been discontinued in the Post Office, chaps are finding it difficult to obtain Morse practice.

The Morse Tapes are on 5-inch reels (1,200 feet) and the recordings have been made at 3¾ i.p.s. Two hours of Morse are on each reel. The Service is free to anyone wishing to learn Morse. Each user is asked for 1/6 per tape to cover "out of pocket expenses".

To obtain a tape application should be made to the Education Officer, VK2 Division, Wireless Institute Centre, 14 Atchison Street, Crows Nest, N.S.W.

The following tapes are available:—

Special Tape for "Raw Beginners," Letters and Figures with comments.

No. 1—One hour at 5 w.p.m., plus one hour at 6 w.p.m.

No. 2—One hour at 7 w.p.m., plus one hour at 8 w.p.m.

No. 3—One hour at 10 w.p.m., plus one hour at 11 w.p.m.

No. 4—One hour at 12 w.p.m., plus one hour at 14 w.p.m.

No. 5—One hour at 15 w.p.m., plus one hour at 16 w.p.m.

CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radio."

Practical Designs for . . .

HIGH STABILITY VARIABLE FREQUENCY OSCILLATORS*

Part Two—Assessment of the Vackar Oscillator with Circuits and Values for 1.8-39 Mc.

PAUL HARRIS, G3GFN

HAVING used the Vackar oscillator on a wide range of fundamental frequencies over a number of years, the writer recently undertook quantitative assessment of its performance in order to obtain verification of certain features which had become apparent. Elementary initial tests indicated that a comprehensive study of this oscillator would be well worthwhile, particularly if at the same time optimum values were determined for the Amateur frequency allocations and other frequencies used in Amateur equipment.

Three oscillators were constructed with basic frequencies of 500 kc., 1.25 Mc. and 5 Mc., and each in turn tuned to beat with the MSF transmission on 5 Mc. After a stabilising period of one hour, the beat was adjusted to precisely 1 kc. and displayed on a direct-reading frequency meter. The oscillator under test was then switched off for half an hour. Upon switching on—both h.t. and l.t. at the same instant—the initial stabilising time to return to the 1 kc. beat, initial drift, and long-term stability over a three-hour period were noted. The results are shown in Table 1.

Frequency of oscillator under test	M.S.F. freq.	Harmonic of oscillator	Initial stabilising period	Actual initial frequency shift	Initial shift in fundamental frequency	Initial shift as %	Further drift over 3-hour period	Long term stability as %
500 Kc.	5 Mc.	× 10	10 secs.	250 c/s.	25 c/s.	0.005%	5 c/s.	0.001%
1.25 Mc.	5 Mc.	× 4	10 secs.	400 c/s.	100 c/s.	0.008%	10 c/s.	0.0008%
5 Mc.	5 Mc.	× 1	15 sees.	400 c/s.	400 c/s.	0.008%	25 c/s.	0.0005%

Table 1.

NOTES:—(a) Valve type EF91. (b) All power h.t. and l.t., applied at same instant. (c) H.t. 105v. stabilised by VR105/30.

This table shows the quite remarkable performance of the oscillators tested in respect of the parameters measured. The figures given are the average of three runs on each oscillator, all of which agreed very closely. From the results obtained, upon which no information was given in the original report, it seems likely the tolerances quoted for (a) voltage variation v. frequency change (10 per cent. variation in h.t. producing a change in frequency of 0.0005 per cent.), and (b) frequency change v. temperature (20°C. change in temperature producing a frequency shift of 0.0014 per cent.) quoted in Ref. 2 would be easily substantiated.

Precise measurements of the relative levels of low order harmonics of the three test oscillators showed that the second harmonic was 32 db. down and the third harmonic 45 db. down on the fundamental.

Concerning the test oscillators themselves, it must be stated that they were made mechanically very rigid with only first class components. Furthermore, particular attention was paid the disposition of components and the temperature gradients likely to be encountered by them, especially those directly involved in the frequency determining circuit. Details of this layout are given later.

REASONS FOR STABILITY OF THE VACKAR

Why is the Vackar oscillator so stable? Primarily for three reasons—

(a) The valve capacities—as in the Clapp oscillator—are effectively swamped by fixed capacitors forming part of the tuned circuit, but—unlike the Clapp—also with regard to any changes in interelectrode capacities. Due to their arrangement, these capacitors remain sizeable even at high frequencies, so maintaining the stability factor.

(b) The valve operates virtually in class A, so holding harmonic circulating currents and phasing effects to a minimum.

(c) The cathode of the valve is held at earth potential and is in no way associated with the tuned circuit or feedback path.

In the original review of the Vackar oscillator in the R.S.G.B. "Bulletin," and as will be seen from Fig. 6 (see Part 1), mention was made of the fact that the circuit required the use of a two-gang tuning capacitor, and this may well have hindered its adoption. However, it was indicated that a single tuning capacitor could be employed.[3]

Realisation of the ultimate stability of which the Vackar circuit is capable will be given when a twin gang tuning capacitor is used, for then the oscillator operates under balanced conditions. Nevertheless, with the exception of oscillators constructed with basic frequencies higher than 15 Mc., and over the limited deviation required for the Amateur bands, a single tuning capacitor has been found entirely satisfactory. The oscillators evaluated in Table 1 employed single tuning capacitors.

With regard to the circuits which are to follow and the values given in their associated tables, it should be stressed that these are those used in practical oscillators constructed to verify calculated parameters, and where corrections were necessary, the corrected value is quoted in the table concerned.

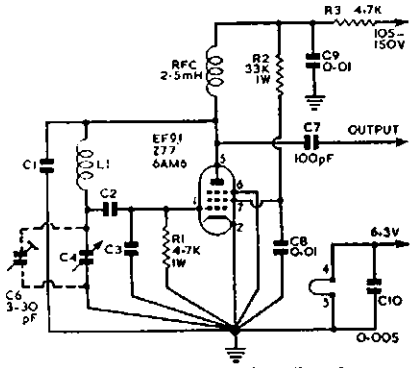


Fig. 7.—Vackar oscillator for the frequency range 1.5-15 Mc. For the values of C1, C2, C3, C4 and L1 see Tables 2 and 3. Trimmer C6 is optional. C7 is a d.c. blocking capacitor. R3 is mounted outside the v.f.o. box.

OSCILLATORS FOR 1.5-15 Mc.

Where the frequency is below 15 Mc. a single pentode type EF91, Z77 or 6AM6 will give excellent results. These types may be replaced by any similar valve with a Gm of the order of 7.5 mA/V. The circuit is shown in Fig. 7 while Table 2 specifies values for fundamental frequencies of 1.8 Mc., 3.5 Mc., 7 Mc., 8 Mc., 9 Mc., 10 Mc., 11 Mc. and 14 Mc.; those for 8 Mc. to 11 Mc. being included for their utility in v.h.f. equipment.

Table 3 details the values of components for use with the circuit of Fig. 7 for any frequency in the range 1.5 Mc. to 15 Mc. The values given are those which will give substantially level output over the frequency bands indicated.

Range	L1 S.w.g. Enam.	L1 Turns c.w.	C1 pF.	C2 pF.	C3 pF.	C4 pF.
AMATEUR BANDS:						
1.8-2.0 Mc.	34	70	556	4700	556	15-250
3.5-3.8 Mc.	28	45	500	2700	300	10-100
7.0-7.1 Mc.	26	30	200	1800	200	10-25
14.0-14.35 Mc.	24	15	100	1000	100	10-35
SPECIAL FREQUENCIES:						
8 Mc.	26	25	200	1800	200	*
9 Mc.	26	20	200	1800	200	*
10 Mc.	24	25	140	1800	140	*
11 Mc.	24	20	140	1000	140	*

Table 2.

For use with circuit of Fig. 7. For Amateur bands 1.8-14 Mc.

All coils wound on 5/16 in. diameter formers fitted with ½ in. long iron dust cores. Winding sense: from foot of former towards top. *Depending on frequency swing required. See text.

* Reprinted from B.S.G.B. "Bulletin," Mar. '64.

[3] "The Amateur Radio Handbook," R.S.G.B., page 169.

COMMON CONSIDERATIONS

Notes which apply to all tables are now in order. The values given for Amateur and special frequencies are those which produce virtually the same output on each frequency within a similar valve group. That is, the output of an oscillator on, say, 7 Mc. will be of the same order as that from any other in that group—the 1.8 Mc. oscillator for example.

It will be noted that only in the case of the Amateur bands is a value quoted for a tuning capacitor. For other frequency ranges the value will have to be experimentally determined according to the frequency shift required.

Range (by adjust. of core)	L1 S.w.g. Turns Enam.	L1 S.w.g. Turns e.w.	C1 pF.	C2 pF.	C3 pF.	C4 pF.
1.5-2.5 Mc.	34	70	556	4700	556	*
2.3-3.3 Mc.	34	45	556	4700	556	*
3.2-4.5 Mc.	28	45	500	2700	400	*
4.3-6.3 Mc.	28	35	300	2700	300	*
6.1-8.8 Mc.	28	30	200	1800	200	*
7.8-11.0 Mc.	26	20	200	1800	200	*
10.5-15.0 Mc.	24	20	100	1000	100	*

Table 3.
For use with circuit of Fig. 7 for general coverage 1.5-15 Mc.
Formers as for Table 2. *See text.

All the coils are iron cored, and with stray capacities of about 10 pF., adjusting the core will bring the oscillator on to the special frequency with the core of the coil concerned set at about mid travel. Adding capacity at C4 will lower the frequency by an amount depending on the maximum value of the added capacity. In the case of general coverage coils, the frequency range shown is that over which an oscillator would tune by running the core of the coil from one end of its travel to the other, again assuming circuit stray capacities of the order of 10 pF. For any tuning range the coil is selected which will, by adjustment of its core, tune to the highest frequency required. The value of C4 is then determined experimentally to tune the circuit to the lower required frequency.

Two types of 5/16 in. diameter formers are available. One is a straightforward type—see Fig. 8—and the other, usually supplied with a screening can and normally used in the construction of i.f. transformers, has a square base fitted with eyelets for wire termination and is threaded for 6BA fixing bolts—see Fig. 12. Of the two types the latter makes coil construction easier, and it has the added advantage that it is available on the surplus market. The length of former required is 1 in. and any excess can be trimmed down with a fine saw.

It has already been stressed that construction and layout hold almost equal importance with the actual circuit used. For this reason precise layout and construction details are provided for both of the circuits given. While these are not the only arrangements which would prove satisfactory, they are those used in oscillators built to check performance and values. In these layouts, account has been taken of the temperature gradients likely to be encountered by components, especially those associated with the tuned circuit.

Figs. 8 and 9 show the layout of the series of oscillators derived from the circuit of Fig. 7, while Fig. 10 shows the general construction of the chassis/box assembly. This is the form of construction used for the oscillators evaluated in Table 1.

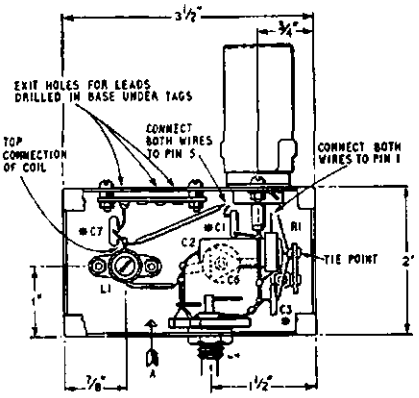


Fig. 8.—General component layout of 9 Mc., 11 Mc., and 14 Mc. oscillators. Main dimensions to be adjusted to allow correct fitting of C4 in 1.8 Mc., 3.5 Mc. and 7 Mc. oscillators.
* Vertically mounted.

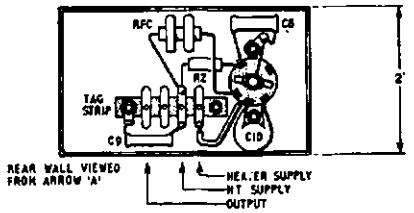


Fig. 9.—Rear wall.

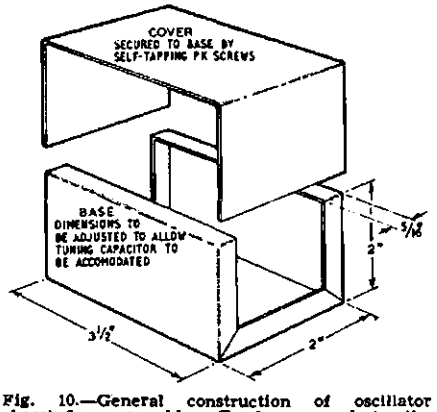


Fig. 10.—General construction of oscillator chassis/box assembly. To be secured to the main chassis by PK screws. Clearance hole to be cut in chassis to allow passage of leads from oscillator. Ventilation boles ¼ in. diameter to be drilled in main chassis directly under oscillator valve position. Material: 16 s.w.g. or 18 s.w.g. aluminium.

OSCILLATORS FOR 14-39 Mc.

Above 15 Mc. a really effective buffer should always be used after the v.f.o. to ensure adequate isolation and freedom from pulling. A cathode follower offers almost complete isolation but at the cost of a slight reduction in total available voltage. Where the Vackar oscillator ciruit is employed, this is usually unimportant due to its high output. A useful arrangement utilises the 6U8/ECF82 in which the pentode functions as the oscillator, and the triode as cathode follower. This particular valve also has the additional advantage that substantially the same layout can be used as for the lower frequency oscillators.

Fig. 11 shows the circuit of a Vackar oscillator, employing a 6U8/ECF82, for

Amateur Bands	L1 S.w.g. Enam.	L1 Turns e.w.	C1 pF.	C2 pF.	C3 pF.	C4 pF.
14.0-14.35 Mc.	22	20	100	1000	100	20, 20
21.0-21.45 Mc.	20	15	68	1000	68	15, 15
28.0-29.7 Mc.	20	10	68	1000	68	20, 20

Table 4.
For use with circuit of Fig. 11. For Amateur bands 14-28 Mc.
Formers, cores and windings as Table 2.

Range (by adjust. of core)	L1 S.w.g. Enam.	L1 Turns e.w.	C1 pF.	C2 pF.	C3 pF.	C4 pF.
GENERAL COVERAGE:						
13.5-19.5 Mc.	22	15	100	1000	100	*
18.75-25.5 Mc.	20	15	68	1000	68	*
25.0-33 Mc.	20	10	68	1000	68	*
30.0-39 Mc.	20	7	68	1000	68	*

Table 5.
For use with circuit of Fig. 11.
Formers, cores and windings as Table 2.
*See text.

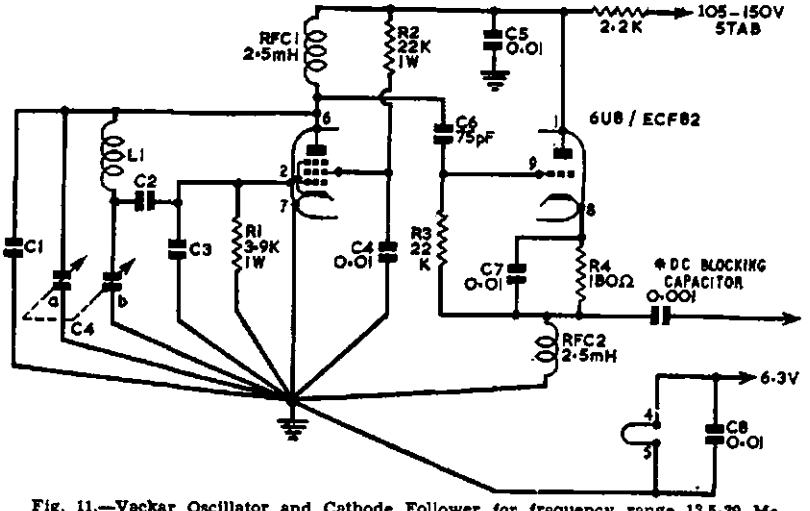


Fig. 11.—Vackar Oscillator and Cathode Follower for frequency range 13.5-39 Mc. For values of C1, C2, C3, C4 and L1 see Tables 4 and 5.

the frequencies of 14 Mc., 21 Mc. and 28-29.7 Mc., and Table 4 details component values. Table 5 provides details of oscillator constants for any frequency in the range 15 Mc. to 39 Mc. The notes previously given on the selection of a tuning capacitor apply to Table 5. Layout and construction of oscillators in this series is shown in Figs. 12 and 13.

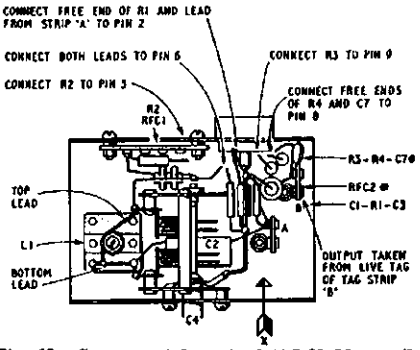


Fig. 12.—Component layout of 13.5-39 Mc. oscillators. *R3, R4 and C7 mounted vertically as is RFC2.

It will be observed that Table 2 and Table 4 both specify values for the 14 Mc. range using the circuits of Figs. 7 and 11 respectively. The circuit of Fig. 11 has the superior performance due to the isolation given by the cathode follower, and this should be employed where stability requirements are critical, such as in s.s.b. applications for example.

KEYING THE VACKAR

As with all variable frequency oscillators, care must be taken if the Vackar is to be keyed directly, especially if keying is associated with the cathode circuit. Above 15 Mc. cathode keying should not be attempted. This is perhaps the weak point of the Vackar oscillator.

Experiments have indicated that, up to 15 Mc., cathode keying is satisfactory **provided** (a) the cathode is held absolutely at earth potential with respect to r.f. by the use of high quality by-pass capacitors connected directly between the cathode pin and the common oscillator earthing point; (b) the heater is by-passed to r.f., and (c) the keying earth return is connected to the oscillator earth point and not to some other point on the chassis. This entails the use of a fully insulated jack socket.

The foregoing comments apply mainly to c.w. operation where full break-in facilities are required with the abiltiy to listen through under key up conditions without resorting to f.s.f. For standard c.w. operation, keying of either a buffer/doubler or the p.a. is to be preferred. For a.m. and s.s.b. with vox or fast bk., direct keying of the actual h.t. line to the oscillator is entirely satisfactory.

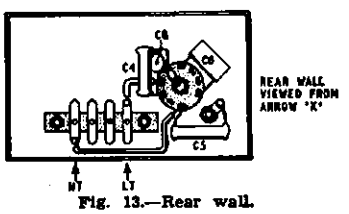


Fig. 13.—Rear wall.

POWER OUTPUT

When designing transmitters it is always useful to know, at least approximately, the power output to be expected from any master oscillator likely to be employed. There appears to be practically nothing on this point contained in any of the standard reference works, and it seems that one either has to make a calculated guess based on previous experience, or live in hope, neither of which seem to be very scientific in this day and age.

In order to further check the performance of the oscillator designs detailed, and to evaluate power output, a simple two-stage driver unit was constructed according to the circuit of Fig. 14. This consists of an EF91/Z77/6AM6 functioning as either a driver or doubler, coupled to a 5763. Table 6 expresses the results of a series of experiments in which the power output of the oscillator—driver/doubler system is shown as grid current to the 5763 through a 22K ohms grid resistor. To make this as comprehensive as possible, the values of C101 and C102 were determined, which produced the usual values of grid current required. As a matter of interest, the details of L_B and the approximate value of C_B are also included.

As would be expected, the smallest difference between the "net" and "loaded" frequencies of the master oscillator coincided with the lowest value of capacity at position C101, particularly in the circuit of Fig. 7. In the case of Fig. 11, and due to the cathode follower, the value of C101 has but little effect on this variation which was, with this circuit, only of a very minor nature.

F in (Osc. o/p. F)o	F out	C101 pF.	C102 pF.	Grid D've mA.	Details of LB and CB (Strays 15 pF.)
OSCILLATOR OF FIG. 7 AND TABLE 2:					
1.9	1.9	5	50	3	LB—90 turns of 34 s.w.g. enamel close wound, ½ in. dia. CB—150 pF.
1.9	1.9	5	25	2.5	
1.9	1.9	5	10	2	
1.85	3.7	10	100	3	LB—75 turns of 34 s.w.g. enamel close wound, ½ in. dia. CB—70 pF.
1.85	3.7	5	25	2.3	
1.85	3.7	5	10	1.9	
3.7	3.7	10	100	4	
3.7	3.7	5	25	3	
3.7	3.7	5	10	2.1	
3.525	7.05	25	200	3	LB—45 turns of 28 s.w.g. enamel close wound. ½ in. dia. CB—30 pF.
3.525	7.05	25	50	2	
3.525	7.05	5	50	1.5	
7.05	7.05	10	75	4	
7.05	7.05	5	25	3	
7.05	7.05	5	10	2	
7.1	14.2	50	100	3	LB—17 turns of 22 s.w.g. enamel close wound, ½ in. dia. CB—15 pF.
7.1	14.2	25	100	2	
7.1	14.2	10	50	1.5	
14.2	14.2	5	100	3	
14.2	14.2	5	30	2	
14.2	14.2	5	10	1.5	
14.5	29	25	100	2.2	LB—7 turns of 18 s.w.g. enamel close wound, ½ in. dia. CB—15 pF.
14.5	29	25	30	1.5	
14.5	29	10	30	1	
OSCILLATOR OF FIG. 11 AND TABLE 4:					
14	14	200	62	3	LB—17 turns of 22 s.w.g. enamel close wound, ½ in. dia. CB—15 pF.
14	14	100	15	2	
14	14	5	10	1	
21.1	21.1	200	62	2.8	LB—12 turns of 18 s.w.g. enamel close wound, ½ in. dia. CB—20 pF.
21.1	21.1	100	15	2	
21.1	21.1	5	10	1	
28	28	200	62	2.9	LB—7 turns of 18 s.w.g. enamel close wound, ½ in. dia. CB—15 pF.
28	28	100	15	1.9	
28	28	5	10	1.2	

Table 6.
Expressing available grid drive in relation to frequency, oscillator circuit, driver function and values of C101 and C102 of Fig. 14.
Oscillator h.t., 105v. stab. Driver VB 250v.

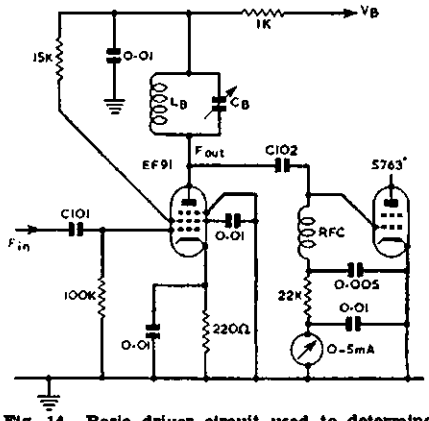


Fig. 14.—Basic driver circuit used to determine available power expressed as grid drive. See Table 6.

In conclusion, it should be stated that it has not been the purpose of this article to write off the Hartley, Colpitts, Franklin and Clapp oscillators, all of which have their applications. Rather it has been to examine closely the whole question of v.f.o. design, to bring the performance of the Vackar/Tesla to the notice of readers, and through the detailed information provided, encourage others to experiment with, and use this circuit which, under present conditions, has much to offer. ●

Wireless Institute of Australia

Victorian Division

A.O.C.P. CLASS

commences

MONDAY, 19th OCT., 1964

Theory is held on Monday evenings, and Morse and Regulations on Thursday evenings from 8 to 10 p.m.

Persons desirous of being enrolled should communicate with—Secretary W.I.A., Victorian Division, P.O. Box 36, East Melbourne (Phone: 41-3535, 10 a.m. to 3 p.m.), or the Class Manager on either of the above evenings.

YOUTH RADIO CLUBS

For the eye that glances here only occasionally, there should be a reminder of the considerable achievements of the Y.R. Scheme. In about three years of development in VK2, some 40 clubs have been established and 14 A.O.C.P's or L.A.O.C.P's have been gained by club members. To press the point about what can be done, the VK2 Honour Roll is listed below. (Other States, especially VK3 and VK4, with a later start, are on their way to similar success.)

(i) Ian Forrest (Booragul High), (ii) George Brzostowski (Lyneham High), (iii) Roger Davis (Lyneham High), (iv) Vincent O'Donnell (St. Leo's Wahroonga), (v) Phillip Lowe (Epping High), (vi) Harvey Smith (St. Leo's), (vii) Jim Watson (Lyneham), (viii) Susan Brown (Booragul High), (ix) Ross Beckley (Booragul (High), (x) Jan Oosterveen (Westlakes Club). (xi) Michael Macinante (C.B.C., Woolongong), (xii) Doug Williamson (Club Leader, Bass High), (xiii) Ralph Satchell (former Club Leader, Homebush High), (xiv) Paul Goldsbrough (St. Edward's, Gosford).

In general, we have a skeleton organisation, at least, in every State, with off-shoots in India, Malaysia, Christmas Island, and New Guinea. In addition, we have exported the idea to New Zealand and Great Britain, where licence requirements are similar.

There should also be a permanent advertisement for new club leaders. It would be particularly helpful if more club leaders could be found amongst those who are not already working with young people. This is a very important point in the story of serious trouble amongst juveniles. The cultivation of "separateness", either through commercial preying on the money in the hands of teenagers or through the extreme adult selfishness of refusing to have young people as even a small off-shoot of their adult organisation and privileges is probably a bigger factor than is realised.

For present and future club leaders, Bob Guthberlet (VK5OD) has kindly offered to undertake the stencilling of Form YRS/10 "Suggestions for Club Leaders and Instructors", an 8-page collection of suggestions gleaned from various clubs. To obtain this booklet, send Bob (a) 8d. stamped, addressed large return envelope (full or half foolscap); (b) extra 5d. stamp enclosed in your forward envelope to help with the cost of stencils, etc. On your return envelope, put "printed matter only" on top left hand corner, print YRS/10 in bottom left hand corner. Address your forward envelope to Rev. R. C. Guthberlet, P.O. Box 89, Mount Barker, South Australia.

All States should notify their State Supervisor now if they have an entrant in the Morse Code Championship for members of Y.R. Clubs. State Championships in over 15 and under 15 grades should be found in time for a Commonwealth Championship in the middle of December.

VK2 news plentiful because of VK2 Newsletter No. 1, edited by Jim Webster at Birrong High. New club at Bankstown Boys' Rally (church group). Very first Y.R.S. member to pass Inter. Certificate was Greg Dunne (3rd year at Kingsgrove High) with 70 and 92 on written papers and a very well-made superhet receiver, an oscilloscope, and a two-valve amplifier as practical projects. Elementary pass (89%) to Geoff McLeod (Kingsgrove). Junior passes to James Poole (88%) at Kingsgrove High. Mr. Freeman, of Australian Radio College, has kindly offered a Scholarship to Y.R.S. members. To be eligible, the candidate must hold Intermediate Certificate (at least this year). The award will give a free course in Radio Servicing, either by correspondence or personal attendance. This should raise some keen competition. Helpful donations of s.w. receiver from Mr. G. Kinnear, of Pymble, and five traded receivers from Mr. Moulang, of Bankstown.

From VK3, Dave 3ZMX writes details of publicity in daily papers for the very youthful stalwarts of Gowrie Park State School, resulting in helpful donations of some assorted gear and enquiries from a local Scout Group. As well as looking after his active A.P.I. Club, Dave is going to put on a display at Bundoora Christian Brothers.

Other news is scarce, but it's the end of a tiring term for teachers (disbelievers are welcome to try). 7EB has been ill and we are all busy anyway. Hope to hear from you all when you can manage it. 73, Ken 1KM.

☆

Publications Committee Reports . . .

Until the 15th September all incoming notes for "A.R." have been published, and in addition correspondence, other than that published in this issue, was received from the following:

VKs 3WK, 5WV, 1LF, 3XQ, 5EK, 5RG, 4ZAZ, 5UB and 6ZDM, in addition to letters from K. A. Harding, C. G. McCue and L3102. The latter was forwarded to F.E. for their attention. Technical articles were received from: VKs 3UJ, 2ON, 4DA and 6HH.

As negotiations have been concluded with the P.M.G., the new edition of the Call Book is now being prepared and a new cover has been introduced with, as someone said, a "Pansy" pink colour. My, that man seems to get into everything.

The new wrapper for "A.R." has proved very satisfactory in so far that several "A.R's" were returned to P.O. Box 36 as being incorrectly addressed and the correct address has been sent to the mailing service for their attention.

Readers are again reminded that all W.I.A. members must notify incorrect mailing addresses direct to their Divisional Secretary. "A.R." should only be notified if the reader is a direct subscriber.

All notes for "A.R." must be addressed only to P.O. Box 36; if they are sent to any other address, delays will occur in publication.

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

Well chaps, the R.D. Contest is over once again, and by mail received, band conditions were not the best, but large scores were accounted for. The best frequencies appeared to be in this order: 7, 14 and 3.5 Mc. with nil reports on 21 Mc. A good variety of calls were present as during my short period of listening, heard on 7 Mc. all VKs from 1 to 0, so the final result should be very interesting.

A WILL AND A WAY

Today, as it was in the past, many Amateurs first started in radio via the ranks of the Short Wave Listener. When I was asked to provide a few lines for this page I wondered what would be best. Since then I came across a practical case of S.w.l'ing. By the nature of my work I travel many thousands of miles each year. In the country one Sunday morning, I wanted to check up on the Divisional broadcast, and when the time came there was not a tree for miles to "string an aerial to", and the only alternative was a fence with a few rusty strands of barbed wire. I connected a jumper between the receiver and this rusty long wire—the result, best interstate DX for months. I ended up missing the broadcast because I came across openings unheard of for some time. The antenna would not have averaged more than a foot from the ground.

You might ask, what is the interest in that, it's no doubt been done many times before. True, but it is an example of what Amateur Radio is, the willingness to try anything to find results for ourselves. If you develop an enquiring mind early in your s.w.l. life, then it continues with you if you obtain your ticket. Tim, L2052/VK2ZTM.

FREQUENCY AND WAVELENGTH

Sometimes, the newcomer to radio finds difficulty in coping with the relationship between frequency and wavelength. To understand these terms properly one must bear in mind the fact that radio waves travel at the speed of light. This is approximately 186,000 miles per second.

To use the common example, if you drop a stone into a pond, ripples radiate outwards in a regular circular pattern. Each ripple represents a temporary disturbance of the water pressure. Think now of an electrical disturbance in space and you can form a mental picture.

The physical distance between two points of maximum voltage stress of the same polarity is called one wavelength. In fact, we can be more general and say that wavelength is the physical distance between any point on a particular wave and the corresponding point on the next wave.

Now remember that radio waves travel at a speed of 300,000,000 metres per second. If a particular signal has a wavelength of say 300 metres, then it would take just one-millionth of a second for one wave to pass a given point. Looking at it the other way, we could say that one million 300 metre waves would pass a fixed point in one second. Being slightly more technical, we would say that a 300 metre radio wave has a frequency of 1,000,000 metres per second. (To be continued.)

NEW SOUTH WALES

Attendance at our monthly meetings has increased considerably, and we are fortunate also in having a steady flow of new members joining our group. It is indeed a pleasant sight to see new faces each month, and we trust that they shall continue to come along. The shield which is to be held for twelve months by the winner of the VK2 receiving section of the R.D. Contest is ready and when the result is known, will be inscribed and forwarded to that lucky person.

From the south-west comes word from Jerry L2229, who is stationed at Wagga Wagga. Hope you found the literature of some value OM, and pleased to welcome you to the page. How about telling us of DX conditions in that area?

Norm L2251, now living in Brisbane, is up and about again after a term in hospital. He has moved to a new QTH and is busy getting set up. He hopes to be soon ready to participate on the DX front, and also to have his L4 number in the near future.

Russell L2262 would like to hear of any S.w.l's who are interested in the Jamboree-on-the-Air, as he is organising in his district and would like to arrange skeds with other members who are Scouters. Russell's QTH is 91 Smart St., Fairfield, Sydney, N.S.W.

Ray L2287 is this month doing the Morse exam. for the second class ticket, and like many of our members is in the throes of other exams., hence the lack of listening.

VICTORIA

Greg L3138 sat the full 24 hours in the R.D. Contest to net a good score. During August he received QSLs from OA1, VR1, EI4, GI3, ZD7, VS1 and VK4JQ. Thanks for your suggestions re the page. Congrats on your win in the R.H. Contest.

Lloyd L3141: QSLs received for the month: 7Q7, 5Z4, 6O1, VP9, EA7, YV5, W0, JA6, HK3, DL5 and W6/MM. He is a member of the Long Island DX association and has promised me some info on same, so as I can pass it on to other S.w.l's.

Noel L3101 participated in the R.D. Contest and compiled quite a nice score. Many thanks for letting me see that letter from South Africa. Yes, we are indeed fortunate to live in a land such as ours. Local interference seems to be a problem that we all share, hi.

Last but by no means least, Eric L3042, has just returned home after a very nice holiday in VK4, during which time he travelled 3,500 miles. Sorry to have missed you OM, but maybe see you early in '65. Eric has 165 QSLs from ships. We would be interested to know if any other S.w.l's. have any such QSLs? Latest cards to hand: FB8, FK8, FO8, OK1, UQ2, VQ8, VS1, ZS8, etc.

QUEENSLAND

Another member enjoying the annual break is Lew L4020, whose other hobby is deep-sea fishing, and naturally is doing a fair bit of just that. Thanks for the crystal ball chart OM, I may use it in the page one of these months.

A newcomer to the L4 section is Noel L4034 who holds the position of State Headquarters Commissioner for Senior Scouts in VK4, which must be very time consuming indeed. Noel uses an HE30 rx with a temporary antenna, and like quite a few others is going to erect a better one at a later date, hi. Thanks for your nice comments re the page.

SOUTH AUSTRALIA

As will be noticed we now have two contributors from VK5. This is very pleasing indeed, and who knows, next month we may have a few more, well let's hope so. Our latest addition is Brenton L5069, who uses an AR8 rx with a long wire aerial. Recent loggings were KA2, WV6, W7, XE1 and KC4 on 14 Mc. During the v.h.f. season you will find the 6 mx band very interesting. I hope that very nice score in the R.D. Contest brings you an award.

Alan L5065: I trust by now that you have received those two diagrams from Sid L2258, who had the matter in hand. Pleased to know that you enjoyed the article in August "A.R." Latest QSLs to band: KZ5, SM3, VE6 and ZLs.

WESTERN AUSTRALIA

From Peter L6021 comes the usual West-side story of plenty of activity. This lad is sure a go-getter so far as s.w.l'ing is concerned. In the recent R.D. Contest he sat at the dials for 21 hours to clock a very good score. These points were compiled from 80, 40 and 20 mx only, as 15 was out, which makes it a very good performance indeed. Recent cards to hand: VS5, VS1, ZC5, 9Q5, DL7, DL5, OH2 and OK3. Stations heard during the month are too numerous to print, but I counted 50.

Articles by members for our page would be welcome, so if you have something of interest to S.w.l's just send it along.

On the DX ladder, appear a few members who have not sent any progress scores for some time. If these are not to hand for the Nov. issue, their names will be deleted.

I would appreciate members' views on a scheme of S.w.l's exchanging letters. Much good can come by corresponding with other chaps, not only in our country, for as I feel if this idea is given support we can seek overseas S.w.l's to participate also.

Sometimes the longest way round proves to be the shortest way home, and the man of experience and wisdom is the one who finds the quietest, simplest and safest way.

That's about it for this month. I would like to thank Tim 2ZTM for his article, and those members who wrote to me. 73, Chas. L2211.

S.W.L. DX LADDER

	Countries Conf.	Countries Hrd.	Zns. Conf.	S.s.b. Conf.	S.s.b. Hrd.	W Stat.
E. Trebilcock	284	292	40	—	—	50
D. Grantley	124	281	38	20	124	35
P. Drew	121	241	32	66	203	29
A. Westcott	93	159	31	9	107	11
M. Hilliard	89	241	33	35	189	12
M. Cox	84	232	30	51	163	21
G. Earl	69	150	31	48	134	7
C.Aberneathy	63	104	33	—	—	14
N. Harrison	56	172	31	22	64	37
L. James	51	144	24	38	122	10
I. Thomas	42	139	20	16	97	14
R. Beckley	27	47	19	—	—	—
A. Raftery	21	125	15	8	8	3
R. Oats	9	26	8	—	—	—

☆

NEW CALL SIGNS

JUNE 1964

VK2YD—T. D. Withnall, 44 Banks St., Padstow.
VK2AYV—R. L. Thornton, 23 Ebley St., Bondi Junction.
VK2BAA—G. S. Radford, 9 Loftus Rd., Pennant Hills.
VK2BAC—A. H. Beusch, 68 Charlotte St., Ashfield.
VK2BAH—L. W. Hodgetts, 183 Liverpool St., Sydney.
VK2BGB—G. B. Burton, 41 Greene Ave., Ryde.
VK2BGG—G. J. Griffiths, 62 Polwood St., Kempsey.
VK2BJO—J. Oosterveen, Lot 4, Gosford St., Awaba.
VK2BJW—J. L. Webber, 58 Shortland Ave., Homebush.
VK2ZDY—B. B. Chatfield, 5 Kapooka Place, Cooma North.
VK2ZFV—C. F. Veitch, 131 Burwood Rd., Croydon Park.
VK2ZGG—A. J. Gray, 37 Culver St., Kogarah.
VK2ZKD—L. J. McHugh, Married Qtrs., 402 Sigs Regt., Wallgrove Rd., Wallgrove.
VK2ZKO—A. N. Nikotin, 49 Waverley St., Belmore.
VK2ZLF—R. Soulle, 17 Jane St., Randwick.
VK2ZLL—P. J. Lowe, 3 Hockley Rd., Eastwood.
VK2ZPA—P. A. Ament, 46 Sinclair St., Crows Nest.
VK2ZXD—G. M. T. Clarke, 2 Beaconview St., Balgowlah.
VK3GP—G. A. Macfarlane, Ormond St., Bairnsdale.
VK3UO—J. O. Williams, 25 Wentworth Ave., Sandringham.
VK3WV—J. E. Walker, C/o. O.T.C., Fiskville, via Ballan.
VK3ZBQ—B. V. Shields, 72 Lloyd St., Strathmore.
VK3ZCF—H. Schroder, Nantilla Rd., Clayton.
VK3ZST—R. S. Tucker, 40 Panoramic Rd., North Balwyn.
VK3ZTY—J. T. Young, 55 Salmon Ave., Essendon.
VK4DS—De La Salle College Radio Club, Scarborough Rd., Scarborough.
VK4JV—J. A. Hazzard, 30 High St., Bundaberg.
VK4MS—M. S. Johnson, Station: Willis Island; Postal: 63 Bombard St. Mt. Pleasant, West. Australia.
VK4TE—T. Smith, Station: Willis Island; Postal: 11a Valley Pde., Glen Iris, Vic.
VK4ZJH—D. J. Hutchins, Lake Manchester, C/o. Mt. Crosby P.O., via Ipswich.
VK4ZRD—K. R. Davis, 346 Henson Rd., Salisbury.
VK5NY—R. S. Bowman, Beau View, Parrakie.
VK5VE—W. N. Thomas, 15 Keevil St., Elizabeth North.
VK5ZE—A. E. Cooling, 20 Blencowe St., Elizabeth Grove.
VK5ZEX—G. E. Bolt, 22 Birdwood Tce., Plympton.
VK6DT—R. D. Trickett, 52 John St., Cottesloe.
VK6LY—R. F. Crowell, 98 Dalkeith Rd., Nedlands.
VK6MW/T—W. H. Murden, Flat 14, 118 Terrace Drive, East Perth.
VK9GZ—Zepczyk (Rev. Fr.), Catholic Mission, Kavieng, N.G.

AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—SO SHOULD A LOT MORE AMATEURS!

D X

VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

According to all reports we have now passed the minimum and we start the slow drag towards the anticipated maximum. Whilst we may not be in the position to appreciate this for some time, it will do our egos the world of good. Due to not feeling the best here over the last few weeks, I must admit that I have not listened with the usual keenness.

160 Metres: No reports.

80 Metres: Some activity from the European area, Russian and Asian districts. Mostly on c.w., but sometimes they are hard to work because of QRM and possibly jamming stations. Best time to try is 2100z.

40 Metres: Nothing to report in a.m. hours local time, but from approximately 0600z G and GI can be worked on s.s.b. Odd South Americans can also be worked. 0900z W, VE, KH, KJ and KC are there for the taking. 1000z brings JA, VS and some of the smaller islands to the north. It was pleasing to hear this month some of the boys saying that they had given this band a go and most were jubilant as to the stations worked and reports received. Try it, you too may be surprised—a.m. or s.s.b.

20 Metres: Still the old reliable band, but appears to be ready to go through a change. Not a great deal in the a.m. hours local time, however at 0430z some contacts with the South American continent are available. Skip shifts as usual to W, VE and thence KL7 to JA etc. Some evenings and on the improve is the Europeans around 1130z and perhaps a little later. 0600z the African quarter can be worked on most days with signals of varying strength. Late in the evenings local or approx. 0130z W can also be worked. Whilst just prior the islands to the north of VK can be heard although this varies each night. Ever noticed just lately how selective the skip is to a particular area, even with stations only a hundred or so miles apart?

15 Metres: A few JA stations are showing up in the a.m. hours VK time, plus a few W signals during p.m. hours. This band should show an improvement in the next few weeks.

10 Metres: Nothing to report.

ACTIVITIES

VK2AI and VK2AAK heard on Lord Howe Island on 80, 40 and 20 mx, causing some pile-ups and confusion on 14270 kc.

Bill VK2XT is going on holidays to JA, calling in to Hong Kong and ZL on the way home. Bring back some goodies, Bill.

France VQ8AM intends operating from Rodriguez Islands as from 14th November. He has Heathkit gear and will operate a.m., cw., s.s.b. He, however, has a problem in that he cannot locate a 110v. alternator; anyone help? QSLs go to home address.

By the time you read this, the 1964 Scandinavian Contest will have been completed, i.e. c.w. is held Sept. 19-20 and phone 26-27. For checking all logs will go to Karl O. Friden, SM7ID, Box 2005, Kristianstad 2, Sweden. A quick summary of the 1963 results were as follows: c.w. single operator, SM5BAU, 116,685; multi operator, OH2EW/0, 202,160; phone single operator, OH5SM, 9,400; multi operator, OH2QV, 5,036. In the non-Scandinavian entries, c.w., s.o., OK1AGI, 3,838; c.w. m.o., 3,900; phone s.o. DJ5BV with 320, phone m.o. DL0NR/P, 512 points. Final scores were: 1, S.R.A.L., Finland, 1,701,697 points; 2, S.S.A., Sweden, 974,000; 3, N.R.R.L., Norway, 235,581; 4, E.D.R., Denmark, 155,551.

YA4A is heard on 14110 kc. c.w. from 1700-1800z.

CR6GO from Angola also on 14012 kc. c.w. around 2200-2300z.

From Perim Island, VS9PGM is on 14050 kc. at 1630z.

YK1AA is on 14 Mc. a.m. from 0300-1100 and 1300-1500z, especially Fridays.

7Q7PBD, from the newly named Malawi, is active on s.s.b. on 14125 kc.

FH8CD from Comores Island has been heard from 1500-1700z on 14250-14300 kc.

7G1L, 7G1RX and 7G1EZ are all active from Guinea on c.w. at 1800-2200z.

Gus has left after many rumours for Europe and Asia. He intends to visit Angus HZ2AMS and they both hope to DX-pedition to YI.

Should you work LX3MZ, QSLs should go via DJ9SB; 5H3HZ via Box 260, Mbeya.

The top c.w. men of the moment in Russia are reported to be UA3AW, UA3CT, UA3AN, K7WQO is 11 years old, resides in Arizona, and has one year of operating to his credit.

EP2DM at Iran is very active on 14075 kc. c.w. and can be heard around 1330z. Operator is Javad who had the misfortune to lose his quad antenna in a recent storm.

5H3JR operates from a mission station in Nyambiti Mwanza, Tanganyika, and is American W3EHG.

ZE2JA currently active on 21 Mc., is located at Borrowdale in Southern Rhodesia, and is operated by Bill Leyland.

K4CSY, from which transmissions on 80-10 mx come, is aboard the submarine "Tusk". S.s.b. and c.w. are used. Reports are good, considering that most operating is done at a depth of 65 feet in the Atlantic!

PJ2AE, of the Netherlands Antilles, has now returned to the United States as W1ITE.

Keep an ear open for VR1S who should be active on c.w. 14 Mc. from Funafuti Island.

From Comoros Island, FH8CD is operating s.s.b. on 14275 kc.

Red China stations BY1PK and BY9SD occasionally give out with a contact.

VQ2AD is operating s.s.b. tx of low power of 8 watts on a frequency of 14276 kc.

SV0WDD, SV0WF and SV0WG are active on c.w. and s.s.b. from the island of Rhodes.

VS9MB is still active from the Maldive Is. on s.s.b. with low power.

W1BB has now worked 75 countries on 160 metres—his latest was 9A1VU.

Cards received through the VK5 Bureau this month include some very good ones and include: MP4BEE, SV0WG, OE2BSL, ZD6BPD, VP8AH, KL7KQ, VS6FI. I1IUS. GM8AT, GI-3LLQ, KH6FBJ, YP1BCD, OZ9KS, HK4AHT, UH8BO, UP2KCA, 4X4MR, DU6TY, VK9RH, ZE7ZR. JT1KAA, VQ8AM, VE7BBB, ZB1BX and OZ6KL.

Ken VK3TL reports that the Europeans are coming in well after 0500z on the long path and picking up on the short path also. 15 mx was open almost all the daylight hours to Asia during the Contest. Some contacts were also made to Asia on 80 mx about 1200z. Ken has contacted the following on c.w.: CE2OF, FB-8WW, JT1KAA, LX3MZ (1210z). OA1U, SP0RF, TF3AB (1210z). On phone FB8WW, 5Z4AM; 21 Mc. c.w., HM5CO. Ken's best QSLs this month: ZP5OG. KG4AM, VP9AK, VQ8BFC (Chagos), 5H3HZ, GB3RAF, VP8HJ (Falkland Is.). Thanks Ken.

Garry VK5ZK, who is doing a masterly job of operating VK5WI of late, reports the following worked on 14 Mc. s.s.b.: UW9CC (1140), UM8KAA (1230), SM5KC (1215), UO5PK (1245), MP4BBL (1300), DJ8CB (1330), UL7FA (1345), YV5AP (0515), XE2HHG (0500), KZ5WI (0530), 4X4JU (0530) long path, XE1MK (0545), XE-1VW (0600), VE7ADF (0615), CR7GF (0630), ZS1YX (0800), ZS6BGS (0815), ZE2JE (0800), whilst on a.m., FO8BL. All times are G.M.T. Many thanks Garry.

From WIA-L6021, Peter Drew has the following to report: DX here is still best on 7 Mc. c.w., wth some quite rare ones like CM2QN and VP4LQ. Most of my DX has been heard between 2200 and 2400 G.M.T. on 7 Mc. with a little around 1830 G.M.T. DL9GN, UR2IP, DL1FF, UAs, OK1QM, YO7DO, SM5BPI, G3EYN, VS1LP, OH5UX, 9M2LO, UL7KDM, DJ2HI, DL1NF, OH1AD, OH2BBM, CR6AI, G2VD. UP2NK, DL7AD, YU1BCD, UL7LK, DL9PU, LZ1KDZ, OZ7BW, SP2IU, YO4YR, YO1WU, HA5AW. VQ8AM, DM3XPA, UB5IM. VP4LQ. SP6AKK, DM5BN, DJ6FO, CM2QN, UB5KDS, VE3BLU, FB8YY, KV4CI, SM5DDA, VR2EG, EL8X and loads of Ws and JAs.

On 7 Mc. s.s.b. the following: KH6FIZ, KJ-6BZ, GI3CDF, G2PU, DJ4GA, VS1LP. Meanwhile 14 Mc. has been mainly full of Ws and JAs as well as little other Pacific stuff like KC6AA, DU1OR. Only other DX outside these areas has been ZS6NE (0550 G.M.T.), ZE8JJ, ZS5QU (0815), ZS6ANE (0810), SM2BJI (0800), FB8WW (0535), DJ9GD (1532), CR7GF (0707), 5Z4IV (0730). All these c.w. except CR7GF and ZS6NE.

You will notice on 14 Mc. only one short path and one long path European for the whole month, although judging by the reception on European stations in the 19-metre band, the best time would be around 0700-0800 G.M.T. long path.

15 metres is useless. VK4BQ most distant station heard during the month.

One DX station logged on 3.5 was YOIHH at 1656 G.M.T. This was during the R.D. Contest. Also heard during the R.D. was VK0PK at 0730 G.M.T. on 7 Mc. a.m., very strong.

QSLs received: VS5LX, VS1LX, ZC5AJ, 9Q5TH, DL7DI, DL5SE, IS1FIC, OH2AH/0, ZS4OF, OE3EX, DL0FT, SM7AYB, EA7ID, CR7CR, SM6BFC, UM8FZ, 4S7AW, G8VG, OZ-1TL, JA5KK, JA1BK, G5RI, PY2AZD, ZS7R, 9G1DV, DL7BB, PA0ZD, OH6NS, DL9OK, PA0RCA/A, I1SCA, I1NAO, UH8AE, VK9RG, OK3KAS, JA3FFD, WN9GBC, DJ8ET. Thanks Peter.

David VK3QV reports especially re 21 Mc. that the band is not dead but just not being used. On the Sunday of the Asian Contest he worked 40 stations in four hours, and there were a lot he did not work. On c.w.: JA1 to JA0, HM5CO, 9M2LO; on s.s.b., W4AXZ/4; on a.m., JA1FKY; on 7 Me. c.w., JA1DDR, JA1KHK, JA1NRA, K4RDU, K7MBP; on 3.5 Mc., c.w., VK9CJ. Thanks David.

Is there anyone in the Amateur fraternity who might be in a position to pass along information to an essential service who transmits telephone conversations to the north of VK that their transmissions are putting some fairly hefty harmonics every 50 kc. into the 20 mx band. Try turning the beam on Hong Kong one evening when they are coming through, if you don't believe me.

A special thank you to all those who have passed on their thanks to me for the bits and pieces we have included in the magazine. Anyone who has any photos, etc., to pass on would you please do so. I can guarantee their safe return.

My very sincere thanks also to the stalwarts who keep sending in their notes for the betterance of the magazine. These are once again Geo 5RX, Ken 3TL, Peter Drew (L6021), Garry 5ZK, Austin 5WO, Launcse 5LD, David 3QV—may your signals never ever fade, fellas. 73, Bert VK5BB.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK2JZ	61	217
VK6RU	2	303	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6MK	43	293	VK3ATN	26	204
VK3AHO	51	289	VK4HR	12	192
VK4FJ	21	280	VK4RW	23	188

Amendment:

VK3TL	62	176

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	328	VK6RU	18	260
VK3CX	26	303	VK3AHQ	79	248
VK2QL	5	301	VK3ARX	66	242
VK4FJ	29	290	VK3XB	75	238
VK3NC	19	286	VK3YL	39	231
VK2AGH	71	267	VK2EO	2	230

Amendments:

VK3AXK	30	190
VK3TL	78	187

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	8	309	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	300	VK7LZ	23	242
VK6MK	74	295	VK4HR	7	233
VK3AHO	76	293	VK2VN	18	233

Amendment:

VK3TL	85	216

V H F

52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

V.h.f. notes for this issue are rather sparse, with some regular contributors missing. The two V.h.f. Group Newsletters are quite interesting and it is hoped that the VK3 V.h.f. Group will present their version in the near future. This is good for v.h.f. enthusiasts as the format produces gossip, etc., for the v.h.f'er without boring all the other devotees.

All VK Amateurs are eagerly awaiting the launching of Oscar III. How many will ultimately take advantage of its ability will have to await its flight. If the achievements of overseas Amateurs mean anything then new chapters will be written into our Amateur history books.

Wally 6ZAA recently visited the Eastern States and I was able to have a 600-ohm QSO with him on his way through Melbourne. Unfortunately was unable to make it an eyeball effort. Any Amateurs visiting Melbourne are welcome at the above QTH for an eyeball QSO or contact me as per details in Sept. "A.R." 73, 3ZGP.

NEW SOUTH WALES

The following is extracted from the VK2 V.h.f. Group's Newsletter. The v.h.f. 24-hour event based on the ideals of the Remembrance Day Contest is over. It appears that over 80 stations took part. There were 27 logs returned and it was won by a country station. Proof enough that if a v.h.f. section was included in the main contest, it would receive support at least to the h.f. section. All who took part enjoyed it, it had three stations in the field for the 24 hours, the activity only stopped between 0200 and 0600. A great many full calls appear in the logs. The Group Committee wish to thank each and everyone of you for supporting this event and hope to see you again next year (on a nation-wide effort). The honour of first place goes to Tony 2ZCT from Newcastle.

Activities. October 2: Meeting; most likely a series of films on Rain Making. Oct. 3-4-5, long week-end: Three field activities. The Hunter Branch will be holding their usual Dinner and field events. The South West Zone will be the usual event and held at Albury this year. The V.h.f. Group will be holding a camping week-end. Horrie 2HL will be the chief scout and he is still wanting to hear from anybody interested. Unless there are 6 to 12 firm starters, it will not be much. Within 50 miles of Sydney. Field events on the Sunday. Contact Horrie and listen to the broadcasts for details. Oct. 25 will be the Wollongong field day. Oct. 28 will be the night fox hunt. Dave 2AWZ and John 2ANF will be the foxes.

From Canberra: John 1ZRX reports that Eddie 1VP is on 2 regularly with 2AAK and 1ZRX. Eddie is building a 432 Mc. rig and has his 8 mx ready for summer. ICR has 10w. on 2 to a halo. 1ZRX is on 2 mostly two or three times a week. He is building for 6, a shack and a tower. His beam is a 3 element closed spaced towards Sydney and Channel ABWN 5A is consistently 5 and 7.

THE BEACON BOX

VK5VF—

6 Metres — 53.000 Mc.
2 Metres — 144.800 Mc.

One call on c.w. then carrier for 40 seconds, then repeat, etc. Operation is almost continuous.

VK6VF—

6 Metres — 52.006 Mc.
2 Metres — 145.060 Mc.

Automatic c.w. identification with approximately four seconds key-down position. Operation is almost continuous.

VK3: ATV0—

51.75 Mc. f.m.
0900 — 2300 hours daily.
(100kw. e.r.p., 2600 ft. elevation)

QUEENSLAND

What has happened to 2 metres of late? The chief development on this band has been the appearance of a 5 x 9 signal from Bribie Island. Ross 4ZAT is responsible for it. Tom 4ZAL took portable 2 mx gear with him when he went to Toowoomba recently, but he had beam trouble. The trouble took the form of a howling south westerly gale. Bert 4CP should be running an 829B to its limit by the time you read this. Tom did visit a number of the boys upon the range and he tells me that Keith 4ZKH could be expected to be using a 2 mx mobile from Picnic Point in the future.

A week or so later Tom went down to the South Coast (Surfers Paradise). I don't know what words he used, but it seems quite likely that John 4RZ, Arthur 4FE and Bill 4WS may be establishing a 2 mx net with the object of both local and Brisbane DX contacts. Finally, it is rumoured that a certain Ham whose v.f.o. is more stable than his crystal on 2 mx is in the process of building a "proper" receiver for the band—at last did you say?

There are some impressive thank-you cards from Scout Hdq. for those who took part in the Easter Scout Venture. It is good to know that the v.h.f. boys are thought of so highly by the Scouts. We thank the Scouts for their kind thoughts and we are only too pleased to make ourselves available and provide radio communications for the Easter Scout Ventures. All those who went to the last venture will agree with me that we Hams had a wonderful time.

While on the subject of Scouts, I may mention that a number of 6 mx stations and possibly a couple of 2 mx stations will be on during the Jamboree-on-the-Air. Stations that will definitely be using their call signs include David 4ZDF, Tom 4ZAL, Angus 3ZIC and Mick 4ZAA.

I have word that John 4ZCT will be looking for 6 mx contacts from the Solomon Islands from November onwards. Rick 4ZWL from Cairns is in the big smoke and has made many local contacts. He may be here permanently now.

Of late there has been talk of a 6 mx tx hunt instead of the regular hunt on 2 mx. The main problem, however, is the relative sizes in directional aerials needed. (We get enough glances from the public as it is when the Mick Mobile goes through the city complete with 2 mx beam.) However, Malcolm 4ZEL says he has solved the problem but as yet we have not heard how.

I have been on holidays for two weeks and took 6 mx gear with me. I heard the Brisbane boys very well, but my gamma match was incorrect. Doug 4ZDL and Neil 4WW came on the bands and one night Doug, Bill 4WS and myself went up to Eagle Heights to work back into Brisbane. The temperature was about minus ten degrees (it felt like it, anyway), but we managed to put a signal into Brisbane on both 2 and 8 mx. Finally, we worked Roy 4ZRM crossband duplex.

Although I could hear the Lismore boys from where I was, I could not make contact —sorry chaps. Last month, there was a DX opening for a short time and I heard VKs 2 and 3. VK5s were also heard. Actually Tom 4ZAL heard ATV0 up here and began calling CQ DX. This produced results and Roy 4ZRM worked Herb 3NN.

Finally, before closing, I should like to welcome Wayne 4ZBN, Dave 4ZJH and Lawrence 4ZLL to the v.h.f. bands. 73, 4ZPL.

WESTERN AUSTRALIA

From the VK6 V.h.f. Newsletter: The Scout Jamboree-on-the-Air will be held on October 17-18. Members 6ZAY, 6ZEA, 6ZEP, 6ZEZ, 6ZEE and 6ZBY indicated they will take part in this activity. Lance 6LR, Alyn 6ZDM, Doug 6ZDW and Tony 6ZDT were asked to be a committee to investigate the difficulties and methods of overcoming same in constructing a 52 Mc. beacon for operation by Gill 6ZBW at Mawson, Antarctica. Gill will leave in December for a 15-month tour of duty.

The meeting on 24th August was a junk sale. Quite a bit of good stuff amongst it too and ably auctioned by Dennis 6AW. 717As were going for 2/-, a 7-9 Command went for £5 and somebody got a good electric fan for 5/-.

Six cars were present at the fox hunt on 22nd August. The fox used a modified Pye Reporter and unfortunately could not be heard at Plain St. due to a faulty coax. connector. However, after opening the first clues and arriving at Mosman Park, all cars found the rig. Properly connected, it has been used to work Bunbury, 90 miles south.

I got an interesting book on inverted vee beams from England recently. Their main advantage is a supposedly lower angle of radiation, but since it does not seem to matter whether the vee is inverted or upright, as in the dual vee beams, I'm wondering if the intermediate position would not be just as good.

Activity on v.h.f. is sluggish due to much re-building of gear. Jack 6BU has built a converter to feed into his Collins 75A3 on 28 Mc. When last heard, he hadn't figured out which 100 kc. pip was which as those net frequency (?) guys were spread over a couple of hundred kilocycles.

Don 6HK has tried etching a crystal with some ammonium bifluoride. 100 kc. a day is the rate and it slows down as the crystal gets smoother. Should be useful for changing 50 Mc. rocks to 52. The crystal should be ground with paste after 200 kc. shift to avoid irregular etching. 73, 6ZAG.

PAPUA

52 Mc.: No DX signals heard during the month and only a little on air type activity locally.

144 Mc.: No signals heard, no activity.

General: The recent burst of activity in the construction field has shown a slight decline. 9ZGB has completed his new tx and is busy on a new rx. 9CK still working on a bigger and better tx. 9ZJD last seen alternating between semi-completed tx, rx, mod. h.t. supply and converters. 9ZBV is packing ports and should soon be active from Rabaul until early in the new year. 73, 9ZBV.

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CALL BOOK MAGAZINES

The Federal Treasurer, W.I.A. is still flogging recent back numbers of "Call Book Magazine" at the bargain price of £1 post free. There are two editions: (1) American Amateurs; (2) Amateurs of the world except Americans (known as the DX Listings). Apply to Bob Boase, VK3NI, 50 Cardigan Street, Carlton, Vic.

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.T.U. FUND

As agreed at the last two Federal Conventions, Divisions were given target figures to meet towards financing representation at forthcoming I.T.U. Conferences. To date, the percentage of the target figures met are shown by States:—

VK2	—
VK3	25%
VK4	23.6%
VK5	—
VK6	21%
VK7	—

The above figures represent monies received by Federal Executive and not necessarily monies still held by Divisions.

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FEDERAL QSL BUREAU

As from 1st September the prefix for Singapore became 9M4 in lieu of VS1. W. Malaya remains at 9M2 but Borneo and Sarawak (E. Malaya) will also have a 9M prefix, the figure not being known at date of writing.

VK4JQ, John Copley, back in N.S.W. after a tour of duty at Willis Island, desires from now on to handle all his own QSLs. He is now VK2AVU, Flat 3, 22 Pavilion St., Queenscliff, Sydney. One of the new men at Willis has a Ham ticket but is unlikely to give it much exercise.

Don Myles, ex-VK0DM, is now located at Flat 2, 178W Toorak Road, South Yarra, Vic. QSLs for his VK0 operation will be issued on the arrival of cards from U.S.A.

The Malayan Amateur Radio Transmitters' Society has recently been receiving applications for a M.A.R.T.S. DX Certificate. As no such certificate exists, the Society wishes it to be known that it awards only one certificate —The Worked All Malayan Area Certificate, the rules for which are reproduced below.

Certificate will be issued on the production of evidence of contacts with the undermentioned call prefixes in the Malayan area: ten in VS1, ten in VS2/9M2, two in VS4/VS5 (one area), one in ZC5.

The Malayan Amateur Radio Transmitters' Society require the observation of the following rules when making an application for the award:

A signed statement to the effect that the applicant observed the rules of his/her licence when making the contacts; all 23 cards to be forwarded with the application; a list of contacts with date, time, frequency and mode of operation; overseas applicants send 10 I.R.C's or $1 (U.S.); that reports are not less than readability 3 and tone 8. Applications are to be made to the "Awards Manager," M.A.R.T.S., P.O. Box 777, Kuala Lumpur, Malaya.

Tribute must be paid in this column to the passing at end of August of my old friend and ex-QSL colleague, Jim Corbin, VK2YC.

For over a decade Jim conducted the Inward and Outward Bureau for the N.S.W. Division. Always a busy man with a multitude of interests, it is amazing how he found the time and energy to cover the wide field of his activities. An amazing man, fond of an argument on any topic, intensely loyal, always of a cheerful disposition, he devoted all he had to any cause he espoused. Some years back he suffered a deep disappointment which left a lasting wound from which he never recovered and this contributed in no small degree to his illness and demise. My deepest sympathy is extended to his willing and able colleague, Ruth—his XYL—and to his family.

—Bay Jones, VK3RJ, Manager.

SILENT KEY

It is with deep regret that we record the passing of:—

VK2YC—J. B. Corbin, M.B.E.
VK3ZA—L. T. Frith.
VK6OR—Jack Hoar, O.B.E.

NEW SOUTH WALES

HUNTER BRANCH

The curfew tolls the knell of parting day,
The ploughman homeward plods his weary way,
The s.s.b. quacks louder every day,
And those who have them clearly get most pay . . .

Talk about Gray having energy when he wrote that lot—freely adapted of course—I've got no energy left after twiddling all the knobs to catch all these new ducktalkers. Farmyard frolics is right with Joe 2ANL and now Jack 2KQ. I shouldn't be at all surprised to hear Zulu Lulu on the quackaphone any day now. Meantime all the rest of us battle on with borrowed and beaten-up rigs. Oh it is a shame and why don't they pay me more money, etc., etc. But the poet is right you know, especially in the last line. Never mind about all these new fangled ideas—stick to steam, as I always say. What do you always say? And having philosophied at some length I must now report the doings of the month in this fair neck of the woods.

The September meeting was another well attended gathering of forty-three members, associates and visitors. Those performing were Tony 2ZCT with a voltage regulated power supply and how to make it, and Ian 2ZIF with all about an s.s.b. (not again) exciter—simplified version. As I was not present at the meeting—a rare occurrence I assure you—I am led to believe all these things. There was a certain amount of coming and going with competition books (they were raffle books if the truth were known) and many confidence tricks were played on innocent members to induce the selling of these tickets. However, it is all in a good cause and will help out with the dinner and field day.

At last justice has been done and the foreign intruders have been repelled. I refer to the Sunday morning call-backs which always include Woy Woy with the Lake Macquarie group. After representations made over several years, this anomalous position has been rectified and Woy Woy is put in its place—on the list of course.

Tony 2ZCT is not only proficient at making voltage regulated power supplies. He can also show the Sydney boys how to operate in a v.h.f. contest. To prove this point, he was able to win the recent VK2 V.h.f. R.D. Contest organised by the V.h.f. and T.v. Group. Tony came in first, despite competition from about 80 other stations.

I am forced at this juncture to hide my head and say profuse apologies to our old vehicle mangler, Sherwood. It is written in the archives that, although my previous comments would suggest otherwise, he has been on the air. This is certainly shattering news, but it must be too good to last. Paddy 2AXU was the lucky member at the other end of the contact.

The boys at Westlakes Radio Club are still progressing with aerials and equipment at the station. Thanks to Joe 2JR, they now have two balun transformers for the h.f. aerials, resulting in freedom from cross modulation and t.v.i. In addition, Henry re-built the top band coupler and Max and Arie finished the ZL Special for 20 mx. The tree climbers (riggers to those who don't know) were Jan 2BJO and Robert, who made things easy for the aerial erection. Many hands make light work at the club and thanks also go to David ex 2ZXA and now 2BSC for the loan of some decent microphones for the Monday night broadcast. There are plenty more helpers, of course, and the club is grateful to them all for their assistance.

Before leaving those lads studying for the A.O.C.P., mention must be made of Arie or Rowley—he answers to both—fitting special brackets on the Suzuki to take an AT21 mobile! This I must see. Bill 2ZL was suitably impressed following his visit to the most efficient station in the Branch and now intends getting the AT21 he owns on the air, especially for top band. We are all wondering what wonderful antenna structure he will use now that the myth of the railway track as a hula hoop has been exploded.

I believe that there is a new small motorcycle which stows in the boot of the car, to be used during traffic jams. Thinking over PanSy's suggestion about Hon. Ken (now assistant blue pencil pusher), one rude gentleman suggested that Max and I should have one such cycle in the car when attending meetings. What puzzles me is whether he intended one to ride and one to run or both to ride? Perhaps Ken, in his wisdom, could suggest a solution. For your information, I now weigh in at 10 stone 51 (it sounds better that way).

Something is afoot in the Merewether area—and how is this known? Frank 2APO has not mentioned aerials for at least three weeks. I suspect he has some ether-crusher hidden away for use in the summer. Gordon 2ZSG is all up in the air about his new shack and well he might be, since it is in a well elevated position. Lionel 2CS and Susan 2BSB were heard making rude remarks the other night about efficiently run stations. I know for a fact they both have decremental modulation! What the summer holds for top band nobody knows, but there are several excellent signals on each night of late. This will probably not reach members before the October meeting, but since the November free-for-all will be on the 6th, I will defer reference to it until next issue. Note he waxes poetic at both opening and close. I bet that wins their praise at the Pincottery. See you when you're older. 73, 2AKX.

CENTRAL COAST ZONE

The main news concerns the recent Lord Howe DX-pedition by VKs 2AAK, 2AI, 2TX and 2AXS. It occupied two weeks in the latter half of August. I understand Phil 2TX was chief penciller and 2AXS chief observer. There seem to have been half a dozen KWM2s and a Drake 2B in use on this island paradise. Anyway, the 240v. supply was good and pure and equal to the demand. 80, 40 and 20 mx bands were in use, but the conditions for DX were generally poor. Despite this, Alec 2AAK had 150 contacts and Reg 2AI about 400. These two stations operated from opposite ends of the guest house so I would think they got in each other's hair. The antennae included a G5RV antenna between palm trees at 20 feet high, and a 24-foot loaded vertical (guyed, no palm trees). The results were not outstanding so with a reel of bell-wire, boy-scout fashion, they whipped up a 3 element fixed beam for 20. Fancy leaving the tape-measure back in VK!

Phil was forced to improvise and he remembered that from the tip of his nose to his outstretched finger-tip was 36 inches. On this basis a three element beam was constructed. The wires were held in place at 16 foot separation by nylon cord and suitably placed palm trees. The s.w.r. was 1.05 I am told. You will see that the device needed six palm trees, and there were plenty of them, so they picked the ones that gave the correct spacing. At times the wind did not blow them all equally and this resulted in a few repair jobs. Reg 2AI says the beam was quite an improvement on the other antennae. For myself, I cannot understand how it succeeded because on returning to VK, Phil measured the above portion of his anatomy and it was 37¼ inches. This would amount to an error of 3 per cent. Guess I'll have to blame the palm tree-effect for bringing it back on frequency!

Maj. 2RU has been on a civil defence course in VK3, accompanied by 2PA. Wally 2AXH is happy with his AT21 and AR7, still manages to work a few ZLs. He is restored to health again, thanks to a new lot of pills. Your scribe has been doing research into selectivity of commercial receivers and finds that mechanical filters are sometimes twice as narrow as they ought to be. The Drake too was 1.9 kc. wide instead of 2.4 kc. at the 6 db. points. Can anyone suggest why this is so? 73, 2ON.

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VICTORIA

SOUTH WESTERN ZONE

Hook-up activity has been fairly spasmotic, due possibly to the colder winter weather, but we remind members of our two weekly hook-ups—Thursday 2000 hrs. and Sundays 1000 hrs.

In the Fire Net world, the Westmere group has QSYed down to 80 and 3AKR, 3AGD, 3ADV and others in their capacity as VK3s

can be heard testing the VL3KJ network on 3780 kc.

Don 3AKN and XYL Peg are both to be congratulated on obtaining their unrestrictive Private Pilots' licences in recent months—also Bill 3XE and Bill 3WK and associate Keith Ross for getting restricted licences. Brian 3XN will soon be on the list and is at present going great guns as a student pilot.

Congratulations to 3AAW, the club station of the Y.M.C.A. in Warrnambool, for taking off the VK3 portable phone prize in the Field Day this year. This effectively keeps this particular section in the zone as one of our members won it last year also.

Peter 3FX will be going into a period of inactivity due to a change of QTH. His new location is on higher grounds and not far from the Warrnambool lighthouse (maybe a long wire to the lighthouse for DX eh, Peter?)

3WK was set up portable on s.s.b. at the recent Warrnambool Technical College's Radio Club's display during Education Week. S.w.l. John Ross was responsible for arranging the very effective display.

David 3ZTN has been operating regularly from Hamilton on Sundays using home-brew 2 mx f.m. on channels A and B. His most regular contact is Don 3AKN. Another station expected on these channels soon is Bill 3XE who is currently wrestling with the bugs in his modified 522.

A number of zone members recently met Lindsay 3ZKL when he visited Warrnambool, along with XYL and harmonics, after living in Orange (VK2) for over 12 months. Lindsay reports that Orange, though cold, is friendly and by now no doubt will be back at toll in that fair city after regretfully leaving sunny Warrnambool. Hope we can work you on 6 again this summer, Lindsay. 73, 3WK.

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QUEENSLAND

NOTES FROM DIVISIONAL COUNCIL

The August Council meeting was held on Thursday 6th and Peter 4PJ chaired the meeting. Eleven members of Council were present. Laurie 4ZGL, the organiser for W.I.C.E.N., was authorised by Council to appoint two controllers to assist him in getting these activities moving in VK4.

A Council vacancy occurred due to the untimely transfer of our Publicity Officer, Norm 4NP. Norm has reluctantly been forced to tender his resignation as he is off to VK2.

Ron 4AQ has been appointed by Council to fill the vacancy. Ron has been Outwards QSL Officer since the formation of the present Council. George 4XY has been appointed an ex-officio member of the Council and will fill the position of Equipment Officer which has been vacant for some time.

AUGUST MONTHLY MEETING

The main business of the evening was a report on Jamboree-on-the-Air preparations. Scout Headquarters Commissioners Barry Smith and Noel Lynch were both present at the meeting and names of Scout Groups, without Amateurs to help them, were read out. This year most frequencies including v.h.f. will be used from the station operating from Scout Headquarters in Brisbane. Although the location is a noisy one, it is hoped that as many stations as possible will call the Headquarters station. Special provision has been made for higher and longer aerials to be erected so good results should be obtained.

The usual lecture after business had been dealt with was given by Sgt. A. Crawshaw, of the Police Communications Branch. The subject was "A Brief Outline of Civil Defence Organisation". Sgt. Crawshaw, an experienced radioman, was one of the successful students at a recent school held at Mt. Macedon in Victoria. He was a confident speaker and although the actual lecture material had very little "radio" content, it was one of those subjects that had interest for everybody. A very enjoyable night was had by all who attended the meeting.

A letter was read to the meeting from 2AVU, formerly 4JQ of Willis Island. He says as Willis Island is a separate country, anyone wanting a QSL card from him should let him know. His new address can be obtained from the VK4 QSL Bureau if the new Call Book has not appeared by the time you read this.

A report on the Division's Annual Dinner indicated that it was a complete success. Twenty-nine members and guests attended and a highlight of the evening was a talk by Kev. Burke on "Broadcasting Arrangements for the Olympic Games at Tokyo." After the lecture, ragchews were going on all over the place—poor Jimmie 4PR, he was at a severe disadvantage as he had a mild attack of Laryngitis.

GENERAL NEWS

Al 4SS is proposing to let us have some DX news again. The thought is very much appreciated and we look forward to regular reports from him. Regular news from W6ASH re Oscar III. has been received at 4WI, via 4TY. Things are really up to date.

John 4RZ seems to be permanently installed in his Southport home. He has moved from Gatton and already beams, long wires and dipoles have appeared. Arthur 4FE is damaging all the S meters in the Southport area, and ex-G 4KD is about to come back on the band. Incidentally, 4RZ was most mystified why he could only get a 5 x 6 signal into Lismore on 80 mx. I will say this though, it doesn't help when you acciderntly use a 20 mx dipole instead of the 80 mx long wire!

An editor for "QTC" still has not been found at time of writing. Peter 4PJ, who has been acting editor for so long now that the job is nearly permanent, could spend valuable time on other Divisional matters. How about offering your services?

The following is part of notes compiled by Newt 4QW while on holidays. Mount Isa—Owen 4OV uses a beam for 20 mx and a triangular shaped antenna for other frequencies. He is very active when work allows, but does not rise early enough to join the Kookaburras. At present the only other active Ham is 4JC. He is unable to receive properly owing to noise from the 132kv. lines across the road. However, he is getting a mobile ready for his holidays.

Charters Towers—Des 4GZ nas a wonderful array of equipment in his shack and is still adding more. He is not yet converted to s.s.b., preferring to use smoke signals. He uses an electronic key expertly. He finds conditions bad for local contacts, the stations being either too close and in the skip or so far away that the noise or QRN interferes with phone. Consequently c.w. is usually the order of the day.

Mackay—John 4FH has a tidy beam above the rooftops but is only occasionally active. 4OP is not at present active at his location due to a change of QTH. Incidentally, Newt was collared into broadcasting for both the A.B.C. and commercial stations while in Mackay—a change from an AB7, AT5 and trap-loaded windom!

Well that's all for now. I hope the band conditions are fair in two weeks time and I wish you all the best in the Jamboree-on-the-Air. 73, 4ZBD.

TOWNSVILLE AND DISTRICT

Seems that all correspondents except PanSy are finding the going tough in getting enough news to keep their notes going. Not meeting enough of the chaps myself, I also find it the same.

A fortnight ago Bert 4LB and myself journeyed to Lower Burdekin Club to meet all the locals in a send-off to Claude 4UX. Claude has been promoted and has since left for Victoria to have a refresher course in television prior to taking over a new station in Childers.

A very pleasant evening and dinner were spent at the Hotel Ayr, where Frank 3ZHF acted as host to the gathering in making a presentation to Claude for the wonderful work that he has done in getting the local boys through their examinations and on the Ayr. Until Claude came into the district, the local activity was practically non-existent. Claude has also been responsible for the local Scouting movement receiving much knowledge in radio taking out portable gear and camping with them on all occasions.

Frank spoke for a very long time in paying tribute to Claude, and I think that even then he was unable to enumerate everything he wished to say in this regard. Bob 4RW suitably backed him up, telling of the long time he has known Claude and the help he has received whenever required. Also tribute was paid to Jess for the numerous cuppa's enjoyed in visiting their QTH. Frank then presented Claude with a brief case in recognition of the esteem of which he was held by the local club.

Claude, in responding, was very much overcome and believe it or not was lost for words. He then traced in a very, very brief way, the course of Amateur Radio in the district and his long association with the W.I.A. and sincerely hoped that the boys whom he had helped would continue on where he has left off and exceed the local club of Townsville in numbers of new members in their ranks.

Two members backed up the other speakers and the evening finally came to an end. Always remember while travelling, there will be a cuppa waiting at Claude's new QTH as you pass through Childers.

Very unfortunate not being on the job when Ernie 2ADL jumped out of the train at my station (railway) to look me up as he and family were passing through on a visit as far north as Cairns. While in Townsville, Ted 4EJ took him in tow and showed him all the best of places and the sights that can be seen. Believe he had trouble in degassing metal 6L6s. Ernie contacted me on the twisted pair on the job, very sorry that I did not meet him in person as I have visited his shack on numerous occasions while in Sydney.

S.w.l. L2136/4, Afton still in the Cairns Hospital and is progressing slowly.

Interference was claimed by local taxi club recently. Just as well I was out visiting the local hospital at the time and not being on the v.h.f. band since the last Ross Hull Contest. Even then, some snide persons trying to see that a harmonic of around 14100 on s.s.b. could be heard on a.m. by the taxi company. Perhaps when all is said and done, it was one of their own cabs which was left switched on (a very wild guess?).

Bill 4ZBE and Don 4ZDM are anxious to start a class for budding Amateurs. While I think it is about time the local high schools were interested in Youth Radio Clubs. Anyone interested in carrying the matter further? Also the University may offer another avenue for our hobby. 73, Bob 4RW.

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SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division was held as usual in the clubrooms to a very representative gathering of members and took the form of a display of members' home-constructed equipment. There is very little new that can be written about this type of meeting night, except to say that the quality of the gear displayed, plus the ingenuity of the members displaying the equipment seems to improve so much each succeeding year. Personally, this type of meeting is the only one in the syllabus which I dislike, not because of the type of meeting itself, but because always at the end of the meeting I have such an inferiority complex that it takes me about a fortnight to get my confidence back. The reason? Simple, when those youngsters have finished their displays and have given their personal explanations of the equipment to a goggle-eyed audience, to say nothing of the fact that one or two of them are only just in their teens, the average oldtimer feels about as ignorant of Amateur Radio and its present day practice, as it is possible to feel.

Anyway, be that as it may, the gear displayed was of a high order and I certainly do not envy the judges their job, although the three of them (Lloyd 5OK, Jeff 5ZP and Geoff 5ZCQ) did not appear to be perturbed to any degree. There were four sections, and the following members filled the placings. Transmitting: Gilbert 5GX with an excellent

s.s.b. rig, followed by a detailed and scholarly description of the set-up. Test equipment: Box 5ZDX. V.h.f.: Trevor Martin, for a very novel approach to a v.h.f. tx. This boy is only about sixteen and stands up and talks to a room full of members with all the poise and assurance of a veteran, and incidentally is more than half the cause of my attack of inferiority complex. And last, but by no means least, Best Constructed Equipment: Al 5MF, with an s.s.b. transceiver that had to be looked at twice to determine that it was home constructed and not of commercial vintage. All and all, a very successful display and one that all present enjoyed, and a definite indication just how far the art has progressed in the past few years. The Acting President (Ross 5KF)—Phill 5NN being absent with or without leave—thanked all of those who had entered the display and made the night so interesting and then threw the equipment open for inspection.

No mention was made of my entry, an invisible three-dimensional s.s.b. discriminator, and why might I ask? Simply because the judges said that they could not see it. How biassed can they be? I make something invisible and they have the cheek to say they can't see it. Just how successful was my entry? Never mind, I am used to such tactics. Remember when Pincott 3AFJ was technical editor for the magazine? He never did publish my article on the differential equation of the modulated symposium of the whoosis. Such is jealousy.

A surprise member of the audience was Len 5YF, who came along with his son. Long time since you turned up at a meeting OM. There should be more of it. He was telling me that it seemed a long time ago since he attended his first such meeting—down at the Railways Institute—my word, that's going back some.

Al 5MF, he of the s.s.b. transceiver, made the understatement of the night when he lifted the lid of the transceiver and somewhat naively said, "There is an awful lot of parts down there"!

Ron 5KS captured the imagination of his listeners when he openly admitted that his XYL had chosen the colour scheme of his s.s.b. rig on display, and then laid them in the aisles when he brazenly stated that he had been stuck for a chassis and the XYL's cake tin came in handy. What a daredevil!

Rob 5RG, after his technical description of his entry and its ability to receive s.s.b. signals, frankly admitted that on a.m. it was not so hot, and before resuming his seat openly leered at me and sneeringly said in a loud voice, "But then nobody listens to a.m. these days". Gercha.

The Secretary (John 5JC) announced at the meeting that Dennis 5OF had returned from the Old Country again, had been lucky enough to secure his old call sign and expected to be active before long. Welcome back OM.

John Vayne, a country member from Ceduna, was noticed at the meeting. This joker has passed his limited exam. but does not intend applying for a call until he has passed his full ticket. He is in the meteorological set-up at Ceduna, which incidentally tickled my sense of humour somewhat—get it? Vayne-Meteorological—Weather Vayne—Meteorological — get it? Oh well, I thought it was funny. Weather Vayne—Meteorological—oh skip it.

Well, the R.D. Contest has come and gone again. Friendships have been made and renewed again, and without doubt this Contest remains the one and only Contest capable of attracting competitors from all walks of life each year without fail. Most of those who enter would not be bothered to even listen to any other form of Contest, and whoever was responsible for thinking up the first R.D. Contest should feel more than gratified with the annual results plus the never-ending enthusiasm. Like many others, my entry into the Contest ranks as only a token one, due to the fact of my shift work, and although I always manage to keep track of the doings on the receiver at work, it is not usually until about 3.30 p.m. on the Sunday that I enter the fray. My entry into the arena this year, as usual, was greeted from all and sundry with ribald remarks, coarse suggestions as to what I should do with my spark coil, and hollow laughter when I give my first number of 59-001 with only about two hours or so left to compete. If I was given a fair go, I would expect to notch up a couple of hundred or so points, but not only do I have to fight my way through the normal QRM associated with the Contest, but I also have to fight a running fight with the interruptions, etc., etc., besides stopping now and then for short conversations with all the breakers-in who show a somewhat unusual interest in my physical welfare and other topics of the day, in no way related to the Contest or anything else. This year the VK3s tried to get into the act with such greetings as "How are you Granpop", "Put that rig back in the mothballs", etc., etc., but I took it all in my stride and slowly but surely pressed forward to my goal of 13 contacts.

Just after I started, I heard Ken 3AFJ calling me, but I ducked up the other end of the band in the hope that he would take the hint. But of course there are none so blind as those that will not see, and he chased me from one end to the other, until finally in desperation I gave in and replied. I tried to bluff him by saying that I did not get his last letter, but he only retaliated by saying, "What about getting a new crystal detector?" Anyway, we exchanged numbers and a couple of compliments, and drifted apart, probably not to meet on the air until next year, but it shows how this Contest affects the mentality because under ordinary circumstances I would have treated him with ignore. With the Contest rapidly coming to an end, and my score in somewhat jeopardy, I committed, for me, the sin of all sins, I called an s.s.b. competitor for a couple of points and then spent the next ten minutes or so fleeing from a horde of "Holier than Thous". All in all, I thoroughly enjoyed myself, I gave the lie to the oft-repeated statement that I could not come on the air, I proved to all and sundry that I could copy s.s.b. signals—may I be pitied and pardoned for stooping so low—and I renewed acquaintance with a great number of old friends, to say nothing of providing some innocent amusement to a number of competitors to whom R.D. Contest day apparently means a chance to get back at me for all I have written during the year. See you all next year, I hope, but always remember that I have the last word, and the pen is mightier than the sword!

By the way, in the sample copy of the log sheet in the magazine I notice 5XU has the pride of place still. What about a change? Something like 5PS, or possibly 5PS, or even for a change 5PS. I am sure Gordon would not mind! I would suggest using my call sign, but my normal sense of modesty and decorum would naturally prevent me even mentioning it!

Cec. 5BZ was one of those to break-in and exchange a few words in the Contest, and quite openly admitted that he was not a competitor this year, but was only sitting back and enjoying the battle. Good to hear from you Cec., when are you going on your next world tour?

Lloyd 5OK was knocking them off at the high end of 40 mx, s.s.b.. or a.m., it made no difference to him, and he had a signal and a half at my QTH.

Wick 5WM tells me that he tried to get into the act several times with a temporary set-up, but as he was crystal controlled it was too hard a battle.

Phil 5NN, our venerable and respected Divisional President, was in the midst of it all and notched a real President's score, even though it was on s.s.b., and certainly gave the VK5 members an example to follow. The score I mean, not the s.s.b. signal!

Going on an unofficial estimate of the VK5 top scorers. I am going to stick out my neck and say that we should have a good chance of sneaking the trophy this year, providing of course that everybody who competed send in their log sheets. However, time will tell, and I could be wrong, but we certainly had a representation above normal and should give the other Divisions a fright, if nothing else.

One or two of the gang who are battling it out with the code these days have asked me if there are any tapes available at various speeds from which they could obtain some valuable experience in receiving. I made a few enquiries locally, but with no luck, however one of my bloodhounds—"Chips" by name—we call him Itty-Bitty-Kitty-Sitty for short—tells me that a Frank Pearson, 2ACQ, who is the chap in charge of the Morse sessions nightly conducted on 3550 kc. from various stations under 2AWI, has several tapes on which various speeds have been recorded and any interested party can obtain use of these tapes by enquiring from the Education Officer for the VK2 Division. It goes without saying that the applicants must have the necessary equipment for replaying the tapes. Anyway, contact your local VK5 Council member on the matter. He may be able to give you more information on the tapes.

Talking of Morse practice, Uncle Tom (5TL), who used to have a Thursday night transmission with various code speeds from Renmark, is not too sure when he will be resuming. It probably seems strange for him not to be doing it after something like 15 years of transmissions. If I remember rightly, he started the session when he was tea drinking at Largs Bay Post Office, when the late Hal Austin was 5WI. My oh my, doesn't time fly?

Jack 5LR, at the moment of writing, is holidaying at Renmark, and my spy tells me that he has been holding serious discussions with Harold 5ZAB on the ifs and whys of s.s.b. Another deserter from the cause? Jack—how could you?

Incidentally, one of the local radio and electrical warehouses in VK5 had a fire recently, and Harold 5ZAB was a bit perturbed on the matter because he had a heavy duty filter choke in their hands and was wondering whether fate had dealt him a nasty blow. However, all was well because the filter choke arrived all OK, much to Harold's satisfaction. You can be lucky sometimes OM.

Heard via the passion fruit vine that 5WI in discussing the Asian Countries Contest rules and the last two figures on the RST report, which indicate the age of the contestant, said, and I quote—"I just don't know how 5PS and those others with three figure ages will get on". Garry, how could you be so heartless and disrespectful to age, why everybody knows that I have not hit the century yet, 99 years and 364 days if you please!

Talking of age, and who wants to, I heard Roy 5AC on 80 mx one night recently. Now there is an old-timer if ever there was one, although to be fair, if I did not know just how long he has been in Amateur Radio, I would not have thought it, going on his sprightly action. Still at the brewery Roy? Do they still have samples? Not that I care of course!

Uncle Tom (5TL) is reported as being seen in the streets of Gawler one recent Friday night. Investigations reveal that there was a choral presentation by choirs in conjunction with the Tanunda Liedertafel on that night, so all was explained. Tom was urged by his old Renmark singing associates to join in, but he firmly declined. He used to wobble a wicked tonsil did Tom. Bingo used to turn green with envy!

Rumour is a fickle jade I know, and rumour has it that a certain VK5 contestant in the R.D. Contest was interrupted during Sunday afternoon by a knock at the back door, and upon investigation found it was the next-door-neighbour, who said that she could hear a voice giving numbers and calling securde on her t.v. set. Our hero, not one whit deterred, told her that the Russians had just fired another satellite which was in orbit over Australia and what she had heard was the instructions to the satellite to keep it in orbit. He advised her to hurry back to her t.v. and listen in some more, because she was very lucky to hear it, and by 5.30 p.m. it would have passed on and would not be audible until about twelve months time. Tickled pink, the neighbour hurried back home, and on Monday night informed our hero that he was a near genius because exactly at 5.30 p.m. the satellite moved on and was heard no more! Well, well, well, there should be a law against it—there is?—well perhaps I should not have mentioned it!

Last month I commented, not very enthusiastically, on the front cover of the magazine with all the "Holier than Thous". This month I comment, full of enthusiasm, on the front cover of the magazine (for August) with its bevy of lovely femininity. I never thought for one minute that our hobby sheltered within its maze of technicalities such a charming group of operators, so petite, so dainty, so attractive and so chic. My address is in the call book girls! Whistle, whistle, whistle. By the way, my old palsy-walsy, my editor to beat all editors, I have a photo of myself available for the front cover if the clamour becomes to loud to ignore!!!!

The results of the 1963 "CQ" World-Wide DX Contest gave me the opportunity to spread Tubby 5NO and Jeff 5ZP in the weekly "Advertiser" column, complete with headlines, as the winners of the multi-operator single transmitter section. Good publicity for VK5 and Amateur Radio in general, to say nothing of confounding my recent critic who coarsely suggested that ordinary mortals never made the column, and if one ever did he would be quite prepared to crawl on his hands and knees to Glenelg. Well, my sprightly young critic, when do you get on your hands and knees? Oh well, never mind, flattery runs off my back like water anyway.

My spies report that Laurie 5XN has given Amateur Radio away in favour of cultivating orchids. This I find hard to believe. He will come back again, bigger and better than ever. Orchids, well did you ever, Pansies yes, but orchids, oh dear, oh dear.

I notice, with some misgivings, that from the land of the deep thinkers comes the self-confessed statement that Ken 1KM asserts that he is in ecstasy because I am supposed to have spoken three times to him in my recent notes. Be that as it may, I now speak to him only once, and that is to tell him that at long last the Education Department of VK5 officially has advised us that they now recog-

nise our work for the Y.R.C., and naturally that gives us the green light for further activity. Try that on your glochenspiel for size!

I also note, again with misgivings, that from the land where they still can't grow a straight banana, that Bill 4ZBD is wondering if I read the news from other States? May I say—Pansy Peruses—Pansy Muses—but more often than not—Pansy just snoozes!

Now before I close for the month, a word to my army of spies and espionage agents. Attention spies, masks on, hats over the eyes, cloaks well wrapped round the body, a few hisses and groans. Now hear ye, hear ye! Have a gander of page II of the September issue of "A.R.," column 3, the last two lines of Pub. Com. Reports. See how he is worming himself in? See his devilish cunning? Never fear—we will defeat him—although it will be a hard job. How low can he sink in his attempts to up-end me? Hiss-hiss-hiss. Sorry you are giving it away Ron 3RN. It's been a long time, and I will try and win that award the first time. But what hope for me with your successor. I am bound to finish in Hints and Kinks!! 73 de 5PS—PanSy to you.

OBITUARY

JACK HOAR, O.B.E., VK6OB

It is with deep regret that we record the passing of Jack Hoar, O.B.E., VK6OR.

Jack was for a number of years a Councillor of the VK6 Division. At the same time he was in the Armed Forces, belonging to the recruiting section. For his outstanding work in this direction he, at his retirement some seven or eight years ago, was awarded the O.B.E. The older Amateurs will miss his cheery voice and the new ones will have missed a lot by not knowing him.

He leaves a widow and a grown up family. We all extend to his widow and family our heartfelt condolences.

Vale, Jack.

WESTERN AUSTRALIA

Have you ever tried to write notes without any information having been passed along? This is what has happened this month, so I hope that someone might read these and then realise that their information could help.

It is with regret that we have to report the passing of one of our numbers, Jack Hoar, O.B.E., VK6OR, became a silent key just after the R.D. Contest.

We have been able to gather some items which could be of interest. Bill 6DX, in Kalgoorlie, very adamantly stated that he would not become a user of s.s.b. If you listen on 80 mx however, you can hear him using this mode and he would like reports, comments, etc., from anyone who would care to give them.

Really, there must be something in this s.s.b. as we now hear faint murmurings of moves in this direction from Woroona and one only VK6RG.

We are pleased to hear George 6GH back on the air after having had a spell in hospital. From what I hear, Len 6LG has not been keeping the best of health so if this is so, Len, we wish you a speedy recovery as we miss your signals on the air.

Please do not forget the Scout Jamboree-on-the-Air chaps. Help make this event one which the young people will remember. Who knows how many may be guided into this hobby of ours by your helping in making your station available.

This year as conditions on 40 mx have been so unreliable for local working, the Council have decided to hold an 80 mx scramble in lieu of the usual 40 mx scramble. How did you go?

Now is the time for everyone, who has any problem or suggestions relating to Amateur Radio, to submit them to your Council so that agenda items for the next Federal Convention can be prepared. Remember that your suggestions, if submitted, could help everybody.

This seems to be all that comes to mind at present and the deadline has come, so till next month, 73, 6RY.

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TASMANIA

Here it is October already. Three-quarters of the year gone. Next thing we'll know it will be the festive season again, which means holiday time, intrastate and interstate travelling, mobile, and portable operation, and even mobile marine for some I expect. Although there is still a couple of months to go, might I take this opportunity of extending to any visitors to the State an invitation to attend any of the meetings held in the various zones. In the North West, Lakin's Hall at Ulverstone, is the venue on the first Tuesday of the month. The Northern Zone meet at the Adult Education Centre, 61 York St., Launceston, on the second Friday each month; whilst Headquarters zone meetings are at the Institute Rooms, 147 Liverpool St., Hobart, on the first Wednesday of the month. The V.h.f. Group hold their get-togethers at the same address on the third Wednesday each month.

At the September general meeting a lecture entitled "Introduction to Pulse Techniques" was most ably presented by Tom 7SW; so much interest was taken in the subject that Tom was "conned" into continuing it at a future meeting.

At a recent Council meeting we had the pleasure of a visit from Mr. Ian Hunter, who is Scout Organiser for the Jamboree-on-the-Air which promises this year to be better than ever. Quite a few members are going into the field for the week-end and all should have a good time. Remember though, chaps, the Jamboree is not a contest, the object is to contact other Scout Groups on the air in other States and we hope throughout the world.

Incidentally, gentlemen, if you derive any pleasure at all from your hobby (and you do, otherwise you'd have a different one), then may I impress upon you the urgency of meeting our commitments regarding the I.T.U. Fund. At the time of writing we are £70 odd shy of our target in VK7. Now if Government loans can be oversubscribed (and they're our nation's future), surely it would be a shame if our hobby's security was undersubscribed, and we lost our bands because we were a few pounds short. Don't be complacent and think we couldn't; if we can't put up a good fight then they'll whittle a bit more off our already meagre bit of the spectrum. So what about letting the moths out and try and see if we can't oversubscribe? Others have done and are doing their share, what about you? 73, Geoff 7ZAS.

NORTH-WEST ZONE

There was a very good attendance at our Sept. Zone meeting, there being 18 members present. Main item of interest was the "Man in Space" and other films presented by our worthy President, Syd 7SF.

Much discussion took place about the recent R.D. Contest, and it was pleasing to note all the activity among local members. Among the rarer call signs heard were Leon 7JP and Dennis 7DR. Othere heard working were Ken 7AI, Syd 7SF, Athol 7ZW, Sam 7SM, Ken 7KH, Max 7MX and George 7XL. Should give us a good score.

Sunday morning broadcast from 7WI has been very good on 80 metres lately, most signals being 5 and 9 both ways.

Ken 7KH has at long last got his new receiver front-end going and had a nice sked with VK0PK on Macquarie Island for half an hour, 5 and 9 both ways. You are doing an f.b. job on public relations down there Peter. George 7XL is still fiddling about with xtal filters and has converted at least one more of our members to s.s.b. David 7MS has finished his "hot" receiver and is getting the latest s.s.b. transmitter just released. Plenty of DX then David.

Associate Ray Schultz has passed his limited and will be doing his c.w. at the next exam. Winston Nickols now has his call sign and Noel Stutterd is waiting for his. Bruce Kelly only has to pass his regs. and we will have yet another call sign in the Burnie area.

Looks like a lot of 2 meter activity on the N.W. coast this summer as besides Winston, Noel and Bruce, Bob 7ZAA, Neville 7ZEE, Mike 7ZAV and Anne 7ZYL will all be active. By the time you read this, Mike and Anne will be on their honeymoon prior to settling at their new QTH at Burnie. Congrats. and all the best to you both.

Athol 7ZW has moved to his new QTH at Cooee and reports ideal conditions for radio out there. Our old congenial friend, Max 7MX, is going to ZL land for a holiday and should arrive at Auckland on 7th Nov. Keep an ear out chaps and you will hear Max and his XYL working from the Ham shacks in ZL where he has many friends. 73, 7KH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. **Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month and remittance should accompany the advertisement.**

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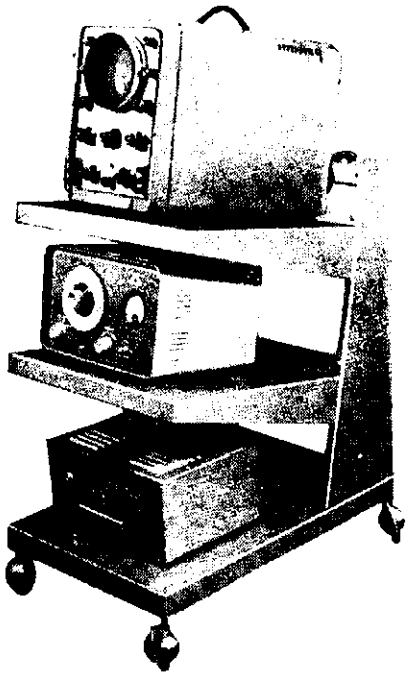

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Effective output level .... —55 db. [0 db. = (one) 1V. Microbar]
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OMNI-DIRECTIONAL DYNAMIC:

Plastic Diaphragm.
Size: 4½" long, 1¾" diameter.
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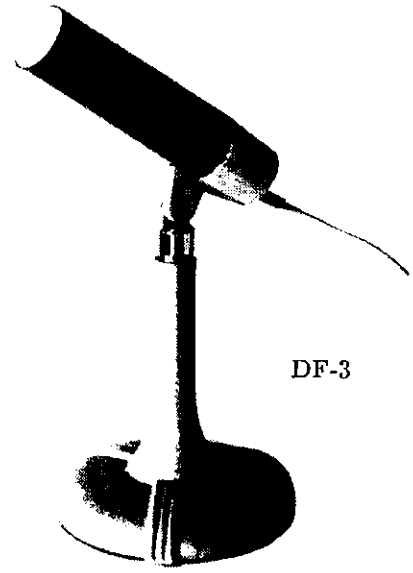

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Average Rectified Current . . . . . ma	8	17	17
Surge Current (1 sec. max.) . . . . . ma	200	500	500

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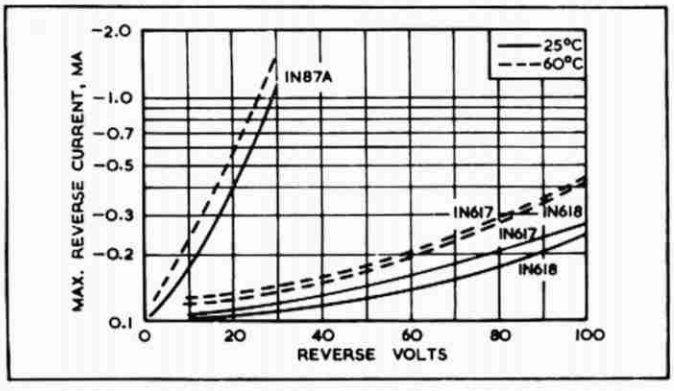

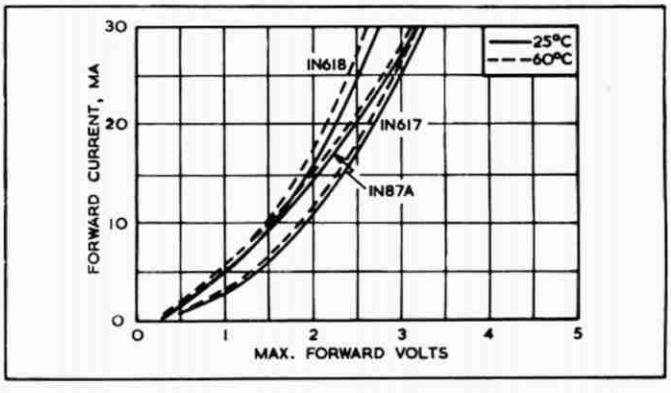

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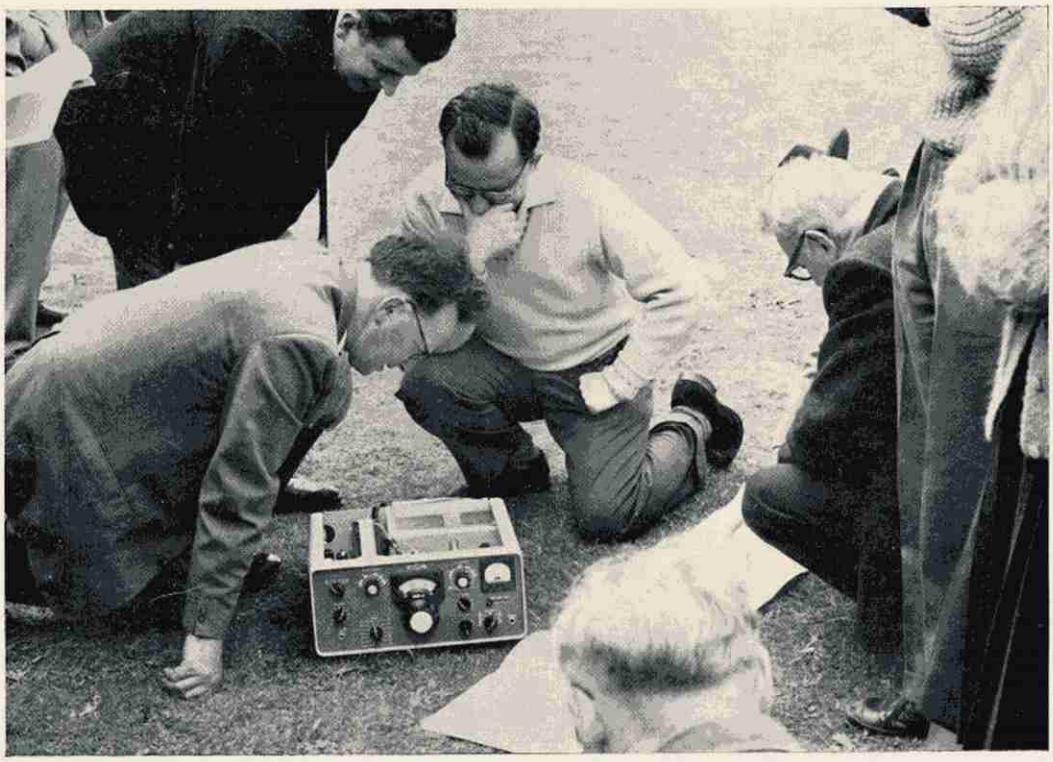
AMATEUR RADIO

NOVEMBER 1964



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2A6	7/6	3 a £1	6AM0	(EF91)	10/-	6SC7	7/6	3 a £1							ECH38	20/-		VT501	7/6	3 a £1
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MR1P 0-1 mA., 1¾ in. square face, 1 in. round hole, clear plastic case 32/6

MR2P 1¾ in. square face, 1½ in. round hole, clear plastic case:—

MR2P 50 uA.	47/6	MR2P 15 mA.	35/-
MR2P 500 uA.	37/6	MR2P 50 mA.	35/-
MR2P 1 mA.	35/-	MR2P 100 mA.	35/-
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MR2P 10 mA.	35/-	MR2P "VU" Met.	45/-

MR2P "S" Meter 45/- (S Meter reads S1 to S9 plus 10 to 30 db. F.S.: 1 mA.)

HCR62 edgewise "S" Meter £4/10/0

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MR52 100 uA. 63/-

MR52 1 mA. 40/-

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MR65 1 mA. 47/6

MR65 "VU" Meter £4/2/6

MR3P 3 x 3 in. square face, 2¾ in. round hole, clear plastic case:—

MR3P 1 mA. 47/6

MR3P "VU" Meter £3/17/0

MO65 3¼ in. round face, 2½ in. hole, black bakelite case:—

MO65 1 mA.	35/-	MO65 1 amp.	35/-
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MO65 10 mA.	35/-	MO65 50a. AC/DC	35/-
MO65 20 mA.	35/-	MO65 15 volt DC	35/-
MO65 50 mA.	35/-	MO65 30 volt DC	35/-
MO65 150 mA.	35/-	MO65 50 volt DC	35/-
MO65 250 mA.	35/-	MO65 50 volt AC	37/0
MO65 500 mA.	35/-	MO65 150 v. AC	42/6
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SO45 20 Volt A.C. 35/-

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Type T502, 2" diam. .... **22/-** „ „

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4 oz. Reels

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18 B & S Enamel	8/6	28 B & S Enamel	12/6
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8H—8 inch, 3.5/15 ohms	57/6
8MX—8 inch, 15 ohms	82/6
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"AMATEUR RADIO"

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P.O. BOX 36,
EAST MELBOURNE, C.2, VIC.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 8th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

★

Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non members of the W.I.A. should write to the Victorian Division, C/o. P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. In the State of residence, in addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

Direct subscription rate is 24/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

★

OUR COVER

Our interested viewers appear puzzled as to the means by which so much is packed into so little. The unit is one of the Collins Line which, along with many other similar types, has done much to make popular the transceiver type of equipment.

FEDERAL COMMENT

★

THE AMATEURS' ROLE IN CIVIL DEFENCE

Before World War II. the Amateur provided the backstay when emergency communications were required. After the war, the Amateur was instrumental in aiding the establishment and training of communication groups in a number of volunteer organisations.

As these organisations progressed and State Instrumentalities set up and expanded their own communications services, the Amateur's role appeared to become less important; however, when the Civil Defence School was established at Mount Macedon, Victoria, investigations by communications study groups soon revealed that the Amateur still had a very important role to play in the early stages of any emergency.

Many Amateurs have passed through the School as representatives of either the W.I.A. or organisations employing them. The importance of this training to the community is inestimable.

The recognition the Government has accorded W.I.A. representatives in this important work is both gratifying and significant.

Each State Premier's Office is allotted a quota for each study group or course. The W.I.A. has always been invited to nominate members for inclusion in the contingent. These study groups embrace every aspect of civil emergency work, and thus representatives of every section of the community take part in general discussions; however, specialised studies or courses are held in every field. In these cases every organisation interested in the particular subject is represented.

All that is asked for participants is that they spread the knowledge and experience gained amongst their fellow citizens. In the case of W.I.A. representatives, dissemination is via W.I.C.E.N., the object being to ensure that a maximum number of skilled personnel will be ready to meet any emergency.

Amateurs willing to help in this work should advise their Divisional W.I.C.E.N. Co-ordinator who will arrange for their names to be added to the list of nominees to be forwarded to the Premier's Office. The success of W.I.C.E.N. depends entirely upon the enthusiasm of members.

As an example, the Victorian W.I.C.E.N. group are to participate in a large scale exercise this month. The success of this exercise from an Institute viewpoint is important from the accorded status, but even more so from the aspect of the practical application of the Amateur's knowledge of communications.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

AN S.S.B. TRANSCEIVER FOR 52 Mc.

I. F. BERWICK, VK3ALZ*

A comparison of the block layout for the 52 Mc. Transceiver (Fig. 1) with the original circuit of the PT116 shows that four additional major components are required:—

1. A 48 Mc. v.f.o.
2. A 4 Mc. crystal filter.
3. A solid state d.s.b. generator.
4. If mobile operation is intended, a new power supply.

Each of these components is built and aligned as a separate sub-assembly. The order in which they are made is of no consequence and can be done according to availability of components, etc. Be prepared to devote quite a few man-hours to each of these assemblies.

Notes on the circuitry, layout and alignment of each sub-assembly appear later, plus diagrams.

● The author has converted a Pye Reporter FT116 to a 52 Mc. S.s.b. Transceiver. A conversion for any other frequency from 3.5 to 144 Mc. is equally possible.

3. Convert Receiver front-end to 52 Mc. This is done as follows:—

(a) Remove coil assembly of L2, L3, L4, re-wind coils with 8 turns 18 B. & S. enamel, wind 2-turn link at cold end of L3. Tap L4 at 7 turns. Replace assembly.

(b) Remove and re-wind L1 with 9 turns 16 B. & S. enamel. Tap at 1½ turns. Replace L1.

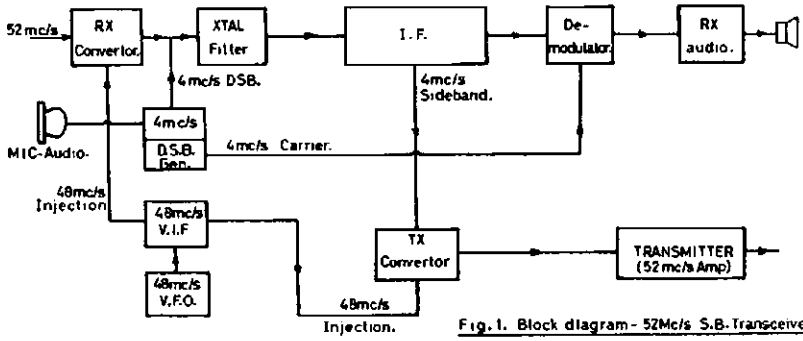


Fig. 1. Block diagram - 52Mc/s S.B. Transceiver.

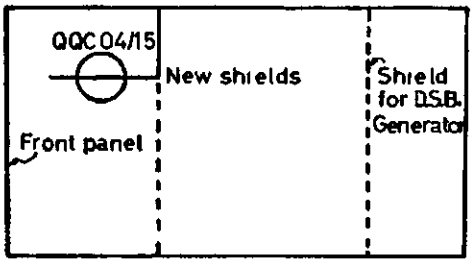


Fig. 2.—Position of New Shields.

The major assembly is the Pye Reporter unit. This is converted as follows:

1. Remove all redundant components and wiring—compare the new circuit with the old for this operation. The following components are redundant:—
   (a) Vibrator power supply.
   (b) IFT3.
   (c) IFT1—the can is saved for crystal filter.
   (d) Mike transformer.
   (e) Socket of V10 and its grid wiring.
   (f) Terminal strip for carbon microphone
   (g) Terminal strip for crystal oscillator V4 and crystal oscillator V12—also crystal sockets.

2. Convert IFT2, IFT4, IFT5 to 4 Mc. Remove 100 pF. across each winding and replace with 33 pF. Then replace IFT2, IFT4, IFT5.

(c) L1, L2, L4 are now grid dipped at 52 Mc. L3 at 48 Mc.

(d) Wire in modifications to receiver audio circuitry.

(e) Mount crystal filter in can of IFT1 and instal in position on chassis.

(f) Fit d.s.b. generator and RL2, RL3 in power supply compartment. A shield partition is fitted to isolate this compartment from the main chassis.

(g) Fit socket for QQC04/15—a loctal type. This has to be lowered approx. 1" below chassis to accommodate the tube. The original shield across the socket will have to be modified to achieve this—additional shielding is added to completely isolate the p.a. tank.

The p.a. loading capacitor, an A.W.A. concentric trimmer with screw-driver adjustment, is mounted on the side wall in the p.a. tank compartment. Wind and instal new p.a. coil and loading (link) coil.

Fit a shim brass shield across underneath chassis as shown in Fig. 2.

Mount connectors for mic. input, v.f.o. input, and antenna.

Complete wiring of Reporter unit—running all supply wiring in shielded cable.

Refer to drawings for layout of various components (Figs. 3 and 4).

CRYSTAL FILTER ALIGNMENT

The performance of the transceiver is critically dependent on this component. I include in some detail two alternative alignment procedures.

Method 1 is the more speedy and accurate method. The test set-up is as per Fig. 5.

With this set-up the filter response curve is viewed directly on the c.r.o. screen. See Fig. 6.

It is now a comparatively simple matter to correctly align the filter.

TR3 and TR4 (Fig. 7) should be resonated at 4 Mc. If the camel hump is not now symmetrical, TR4 should be detuned from resonance slightly, either higher or lower until symmetry is achieved.

R should now be varied to try and further improve the response curve—47K to 39K should give a satisfactory result.

If it is desired to measure the pass bandwidth proceed as in Method 2.

If a satisfactory response cannot be obtained, check that IFT1 is correctly tuned. If still unsatisfactory, filter will have to be re-built. Proceed as follows:

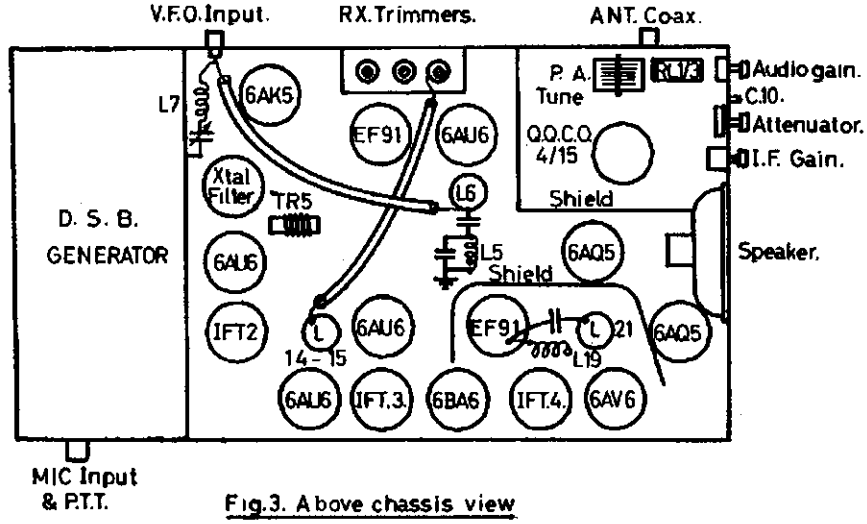


Fig.3. Above chassis view

* 107 Loongarra Avenue, Glenroy, Vic.

Dismantle filter, check pole-zero spacing of each crystal. Measure pole frequencies. There should be two f_1 crystals (± 50 c.p.s.) and two f_2 crystals, where $f_1 \approx f_2 =$ pole-zero spacing.

If not, crystals will have to be shifted around until this is so—either by etching or grinding. Frequency can be lowered if desired by rubbing a little solder onto the quartz. Re-build filter when crystals are OK and repeat alignment procedure.

For the average FT243 filter a response of 3 kc. at 6 db. down and 12 kc. at 60 db. is considered satisfactory with passband ripple not exceeding 3 db.

Method 2: Test set-up as per Fig. 8. Proceed as follows:

(1) Assuming d.s.b. has been previously aligned, insert carrier by unbalancing VR1 (Fig. 16, d.s.b. gen.)—a smooth stripe should appear on c.r.o. screen (audio generator should be off). Peak TR3, TR4 for maximum stripe width.

(2) Remove carrier, inject audio signal (1,000 c.p.s.). If filter correct a nearly smooth stripe should appear. If not, carrier and/or unwanted sideband are present, as Fig. 9.

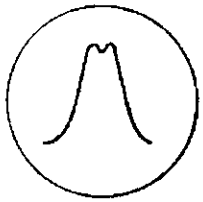


FIG. 6

It is now possible to measure (a) the pass-band response by plotting stripe height in inches or volts (if the c.r.o. is calibrated) against frequency, using db. $= 20 \log E_1 \div E_2$, where E_1 is the maximum stripe height; (b) the stop-band response by plotting stripe ripple against frequency, using db. $= 20 \log E_1 \div E_2$, where E_1 and E_2 are as in Fig. 10.

When a picture of the response curve is obtained by this method, the necessary adjustment of TR4 and R can be made to complete the alignment of the filter.

In this discussion no mention has been made of the frequency of the carrier crystal relative to the filter. In v.h.f. it is usual to use upper sideband.

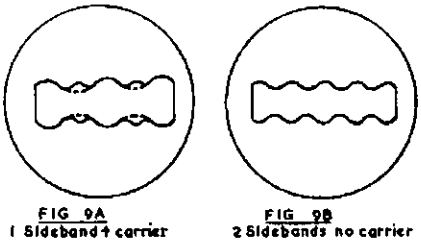


FIG 9A
1 Sideband + carrier

FIG 9B
2 Sidebands no carrier

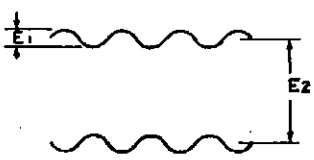


FIG. 10.

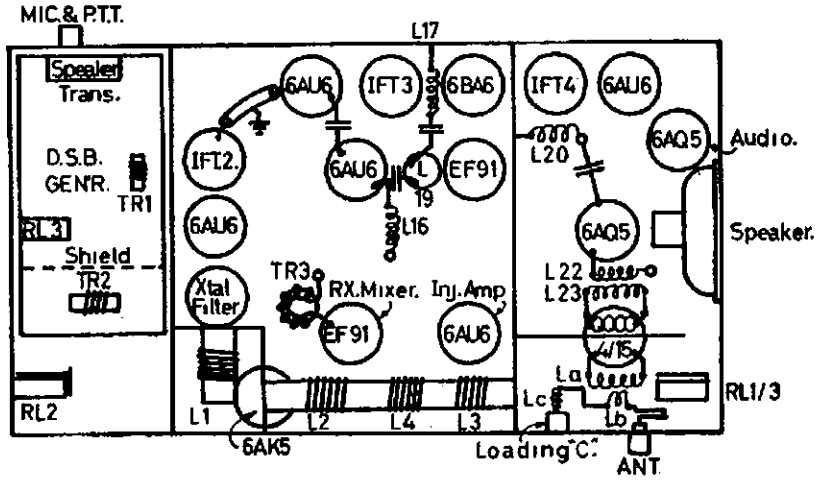
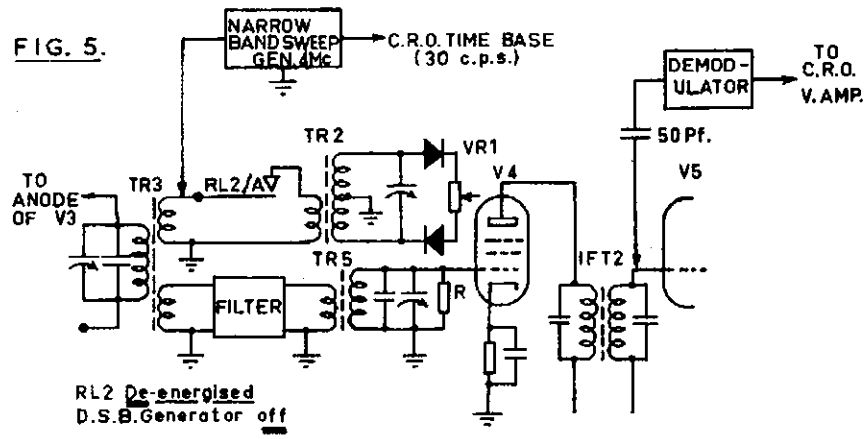


Fig.4. Under chassis view.

FIG. 5.



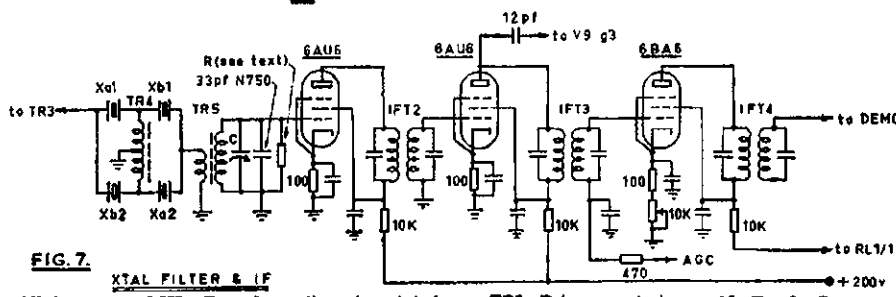
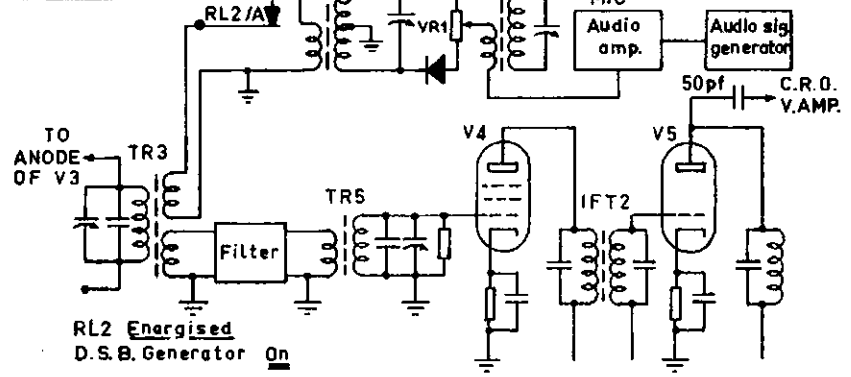


FIG. 7.

XTAL FILTER & IF

All by-passes 2.2K pF. unless otherwise stated.
C—Philips trimmer.
TR4—18 turns 18 B. & S. enamel on Q2 toroid (Ducon).
TR5—Primary: 4 turns 18 B. & S. enamel; Secondary: 14 turns 14 B. & S. on Q2 toroid.
Xa1, Xa2—4000.0 kc.
Xb1, Xb2—4002.0 kc.

FIG. 8.



It is the practice, therefore, to set the carrier frequency 20 db. down the i.f. skirt of the filter.

This occurs usually when the pole of the carrier crystal is approx. 400 c.p.s. lower than the pole of the l.f. crystals in the filter.

The carrier crystal should be ground to this frequency (i.e. f_1 —400) and the alignment as described carried out.

If the tests indicate that a shift in carrier crystal is desirable, this may be done at any time after the alignment of the filter.

Alignment Pictures

Method 1—Fig. 11:

A—TR4 not correctly tuned, unsymmetrical hump, stop-band pop-up.
B—TR4 tuned too far in other direction.
C—TR4 correctly tuned, but R too large.
D—Correct response, TR4 OK, R OK.

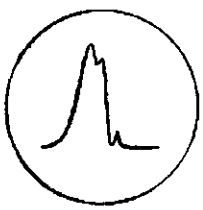


FIG 11A

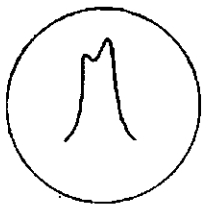


FIG 11B

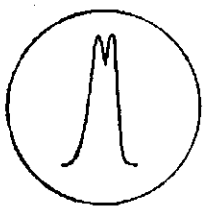


FIG 11C

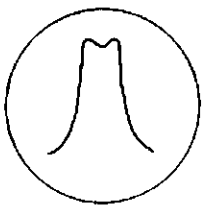


FIG 11D

Method 2—Fig. 12:

A—Smooth stripe, carrier only.
B—1,500 c.p.s. sideband, ref. level 0 db., suppression of unwanted sideband ≈ 25 db., carrier suppression 50 db.
C—500 c.p.s. sideband, ref. level —6 db., s.b. suppression ≈ 10 db., carrier suppression 50 db.
D—3,000 c.p.s. sideband, ref. level —6 db., s.b. suppression 35 db., carrier suppression 50 db.

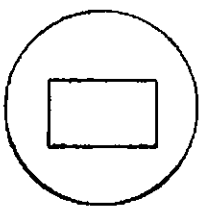


FIG 12A

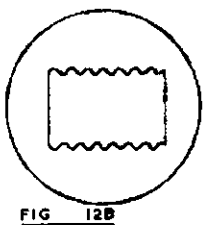


FIG 12B

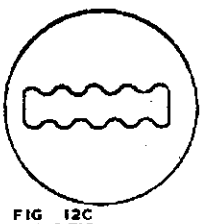


FIG 12C

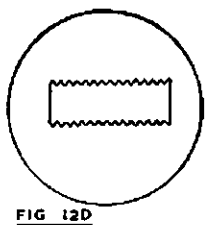


FIG 12D

V.I.Fs.

I propose to make a few remarks introductory to this important subject. I hope to make a further discussion at a later date in connection with a 144 Mc. s.b. transceiver I am developing.

A v.i.f. (variable i.f.) is a device which passes a signal tuneable over a specified range without appreciable attenuation, but highly attenuates all other signals outside this range.

Spurious signals from the injection sources which fall in the v.i.f. and pass through unattenuated are called cross-overs. A very important aspect of v.i.f. design is reduction of cross-over energy. V.i.f's. may be divided into four basic types—

(1) Mechanically or electrically ganged to v.f.o.
(2) Bandpass.

(1) and (2) are further sub-divided into (a) injection v.i.f., (b) signal (or s.b.) v.i.f.

I have used type 2a in my transceiver.

I state without proof the rules for v.i.f. design—

(1) V.i.f. tuning range (or bandwidth) should be minimal contingent upon other design factors, e.g. 200 kc.

(2) The amplitude of a spurious cross-over is an inverse function of its order. Therefore spurious cross-overs should be of high order.

Example: If $f_{VIF} = f_{VFO} + N\ f_{XTAL}$ and $f_{SP} = f_{VIF}$, where $f_{SP} = R\ f_{VFO} - S\ f_{XTAL}$, f_{SP} is said to be of order R + S. For small energy at f_{SP}, (R + S) should be large. Note: R, S, N are integers.

(3) $f_{VIF} \div f_{VFO}$, $f_{VIF} \div N\ f_{XTAL}$, $N\ f_{XTAL} \div f_{VFO}$ } Should not be integers, or if integers, should be large, i.e. > 3.

Readers requiring further information at this stage should consult Collins S.B. Handbook.

It will be seen that in my transceiver tuning range is somewhat greater than is customary, but choice of v.i.f., v.f.o. and crystal are good so that this factor is less serious than it might have been.

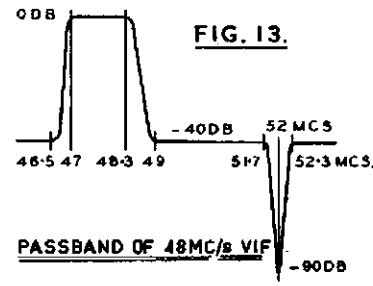


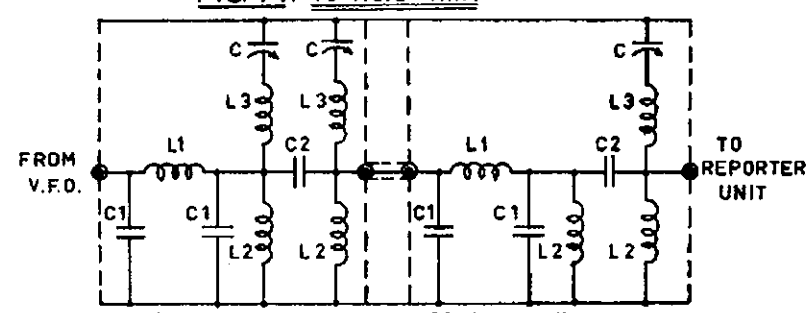
FIG. 13.

Fig. 13 shows the pass-band characteristic of the 48 Mc. v.i.f. This v.i.f. consists of two low pass constant K sections, cut-off 49 Mc., plus two high pass constant K sections, cut-off 46.5 Mc., plus shunt traps to give a notch at 52 Mc. (See Fig. 14.)

52 Mc. TX SECTION

This is explained by reference to the circuit of Fig. 15. A top coupled filter is used between 6AU6 mixer and EF91 class A. This, in conjunction with an absorption trap, prevents the 48 Mc.

FIG. 14. 48 MC/S V.I.F.



C—3-30 pF. Philips trimmer.
C1—56 pF. ceramic.
C2—33 pF. ceramic.
L1—5 turns 16 g. tinned copper, spaced wire diameter. ⅛ inch diam.
L2—4 turns, ditto.
L3—9 turns 18 B. & S. enamel, close spaced. ½ inch diameter. All coils self supporting.

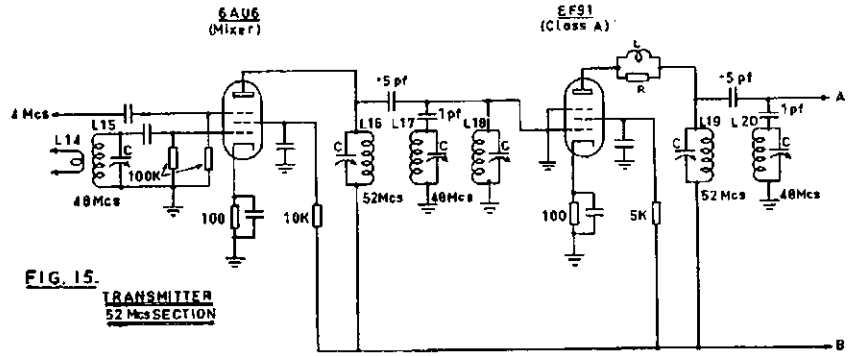


FIG. 15. TRANSMITTER 52 Mcs SECTION

All by-passes 14 pF. ceramic unless otherwise specified.
C—3-30 pF. Philips trimmer.
CN—Philips trimmer, cut down to two plates (1 fixed, 1 moving).
R, L—5 turns 22 B. & S. wound on 47 ohm ¼-watt carbon resistor.
La—10 turns 14 g. tinned, ¾ inch diam. c.t.
Lb—2 turns 14 g. tinned, ½ inch diam.
Lc—4 turns 18 g. enamel, 3/8 inch diam.

injection voltage from appearing at the EF91 grid and driving this stage into non-linearity. A similar circuit arrangement is used between EF91 and 6AQ5, the 6AQ5 being neutralised. Parasitic chokes are fitted in the anodes of the EF91, 6AQ5 and QQC04/15.

The final anode tank is designed to match a 50 ohm load to a 12,000 ohm plate-to-plate impedance.

Alignment of this section is straightforward. All tanks are grid-dipped to the appropriate frequencies. Neutralise the 6AQ5 according to accepted practice, peak the 52 Mc. coils for maximum drive at 52.5 Mc., adjust the traps for minimum 48 Mc. feedthrough, and carry out linearity checks of the final according to the approved procedure.

D.S.B. GENERATOR

The active components in this section are solid state to save space, and simplify the mechanical considerations. The complete unit is wired on a matrix board which fits neatly in the space vacated by the power supply. All information necessary for its construction is given in Fig. 16.

The diodes should be selected so that their forward resistances are approximately matched. Diodes having low forward resistance are preferable.

Alignment: (1) Check preamplifier for gain and linearity with c.r.o. and audio sig.-gen. Gain should be 25-30 db. which is more than adequate for most crystal microphones. Since only several hundred millivolts are required to drive the balanced modulator, gain can be reduced by lowering the value of the negative feedback resistor.

(2) Grid-dip carrier oscillator and bal. mod. toroid TR1 and TR2 at 4 Mc. Note: Toroids have no external field. Use set-up shown for grid-dipping in Fig. 16A.

Check carrier oscillator frequency and output. Approx. 1.5v. r.m.s. should appear across secondary of carrier oscillator tank (TR1).

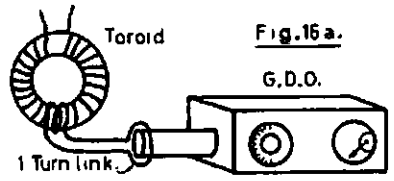


Fig.16a.

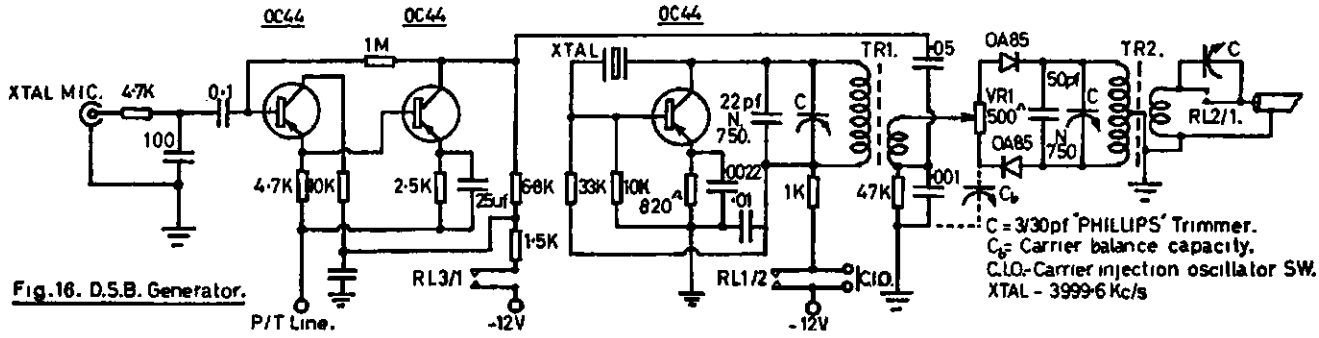


Fig.16. D.S.B. Generator.

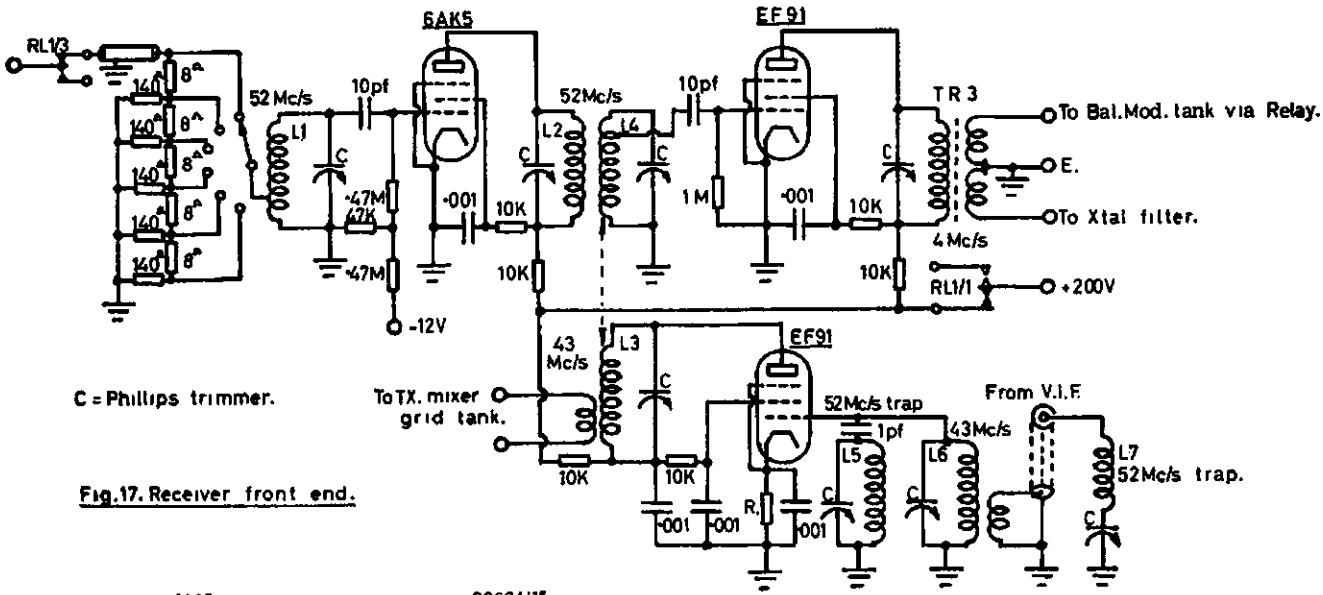


Fig.17. Receiver front end.

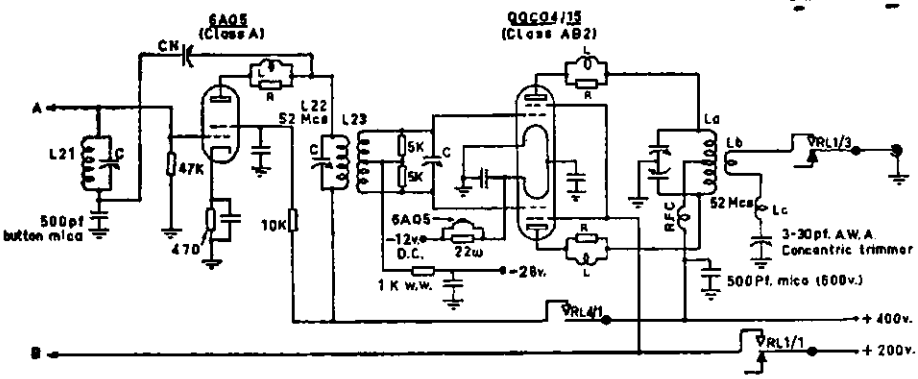


Fig. 16 Parts List

D1, D2—OA85s.
Q1, Q2, Q3—OC44.
TR1—Primary: 14 turns 14 B. & S.; secondary: 4 turns 18 B. & S.
TR2—Primary: 14 turns 14 B. & S. c.t.; secondary: 4 turns 18 B. & S. Both TR1 and TR2 on Q2 toroids (Ducon).

Fig. 17 Parts List

All by-passes are 1K pF. ceramic.
C—Philips trimmer.
R1—8 ohms, carbon.
R2—140 ohms, carbon.
L1—9 turns 16 B. & S., tapped 1.5 turns.
L2, L3, L4—8 turns 18 B. & S. L4 tapped at 7 turns. Wind two-turn link at cold end of L3.
TR3—Primary: 14 turns 14 B. & S.; Secondary 1 and 2: 4 turns 18 B. & S. each. Core Q2 toroid.

Check carrier balance, the potentiometer is the coarse balance control and the capacitor the fine control. It will be necessary to find by experiment across which arm of the balanced modulator the capacitor should be placed. 40 db. carrier suppression should be achieved without difficulty. (Remember that a further carrier attenuation occurs in the filter.)

Check double sideband output in the receiver or c.r.o. for intermodulation distortion. Linearity should be satisfactory if the operating conditions for diode balanced modulators are adhered to.

RECEIVER FRONT-END

Concurrent with modern practice, a stepped attenuator is incorporated. This is mounted on the front panel. The speaker transformer has to be shifted to the rear side wall to make room for this. The 48 Mc. injection amplifier 6AU6 runs all the time. The h.t. to the 6AK5 and EF91 is removed by RL1/1 during transmit, so disabling these stages. See Fig. 17.

The first two i.f. stages run at constant gain at all times. The third i.f. stage has both manual and automatic gain control.

The manual gain potentiometer is mounted on the front panel as follows: Remove top right hand speaker mounting screw, drill a 3/8-inch clearance hole, using the old mounting hole as centre. Mount miniature 10K potentiometer in this hole.

NOISE LIMITER, DEMODULATOR AND AUDIO AMPLIFIERS

This section (Fig. 18) is largely unchanged from the original Reporter circuitry. Carrier for s.b. demodulation is injected into the i.f. after the mixer.

This is achieved as follows: When RL2 is de-energised during receive, thus removing the load from the bal. mod. tank, the balanced modulator becomes unbalanced. A Philips trimmer wired across the contacts of RL2 provides a means of adjusting the level of carrier injected into the i.f.

Carrier derived a.g.c. is shown on the circuit (Fig. 18). An audio derived a.g.c. system on a matrix board sub-assembly is available for fitting, this is not shown as most people seem to have their own preferences with respect to a.g.c. systems.

48 Mc. V.F.O.

This is constructed as an outboard unit designed for mounting on the steering column of a motor vehicle. The 5 Mc. v.f.o. is a modified Command unit. The heterodyning section and the 48 Mc. v.i.f. are mounted in separate

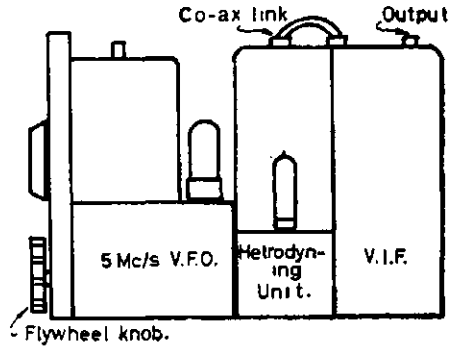


Fig.19. 48Mc/s V.F.O.(side view)

shielded compartments at the rear of the modified Command unit. (See Fig. 19.)

The modification to the Command unit is as follows:—

(1) Remove all wiring under chassis.

(2) Remove front panel, disconnect bowden drive to oscillator capacitor.

(3) Cut through chassis in a line with front of oscillator capacitor.

(4) Mount front panel on the oscillator portion of the chassis so that the tuning gears line up with the oscillator capacitor drive gear.

(5) Wire up as per circuit (Fig. 20). The oscillator is a Franklin followed by a cathode follower and then a class A tuned stage.

(6) Fit a large flywheel tuning knob.

The construction of the heterodyning unit and v.i.f. is straightforward and the diagrams should be self explanatory. Note that these stages run all the time.

(Continued on Page 8)

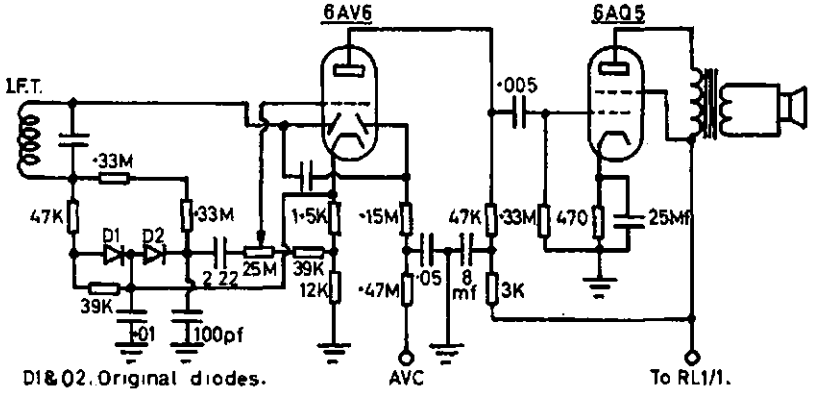


Fig.18. Receiver noise limiter - demodulator & audio amplifier.

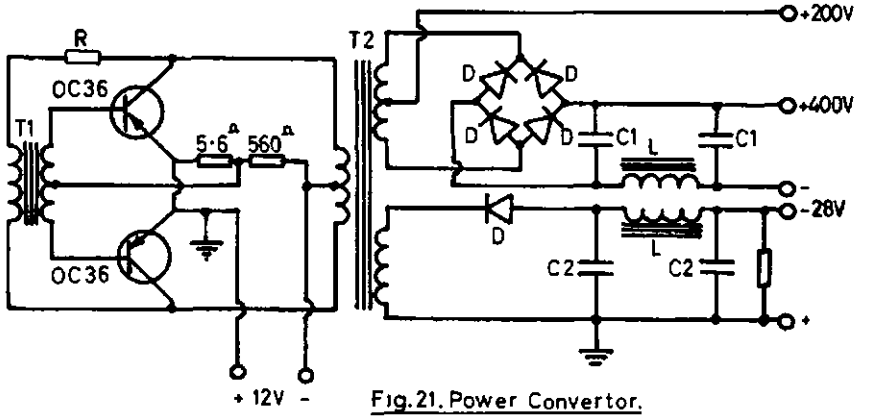


Fig.21. Power Convertor.

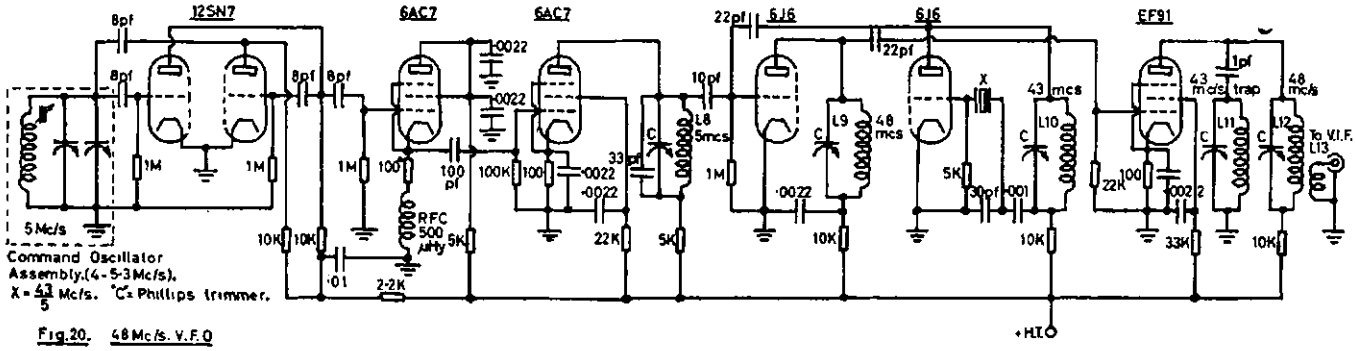


Fig.20. 48 Mc/s. V.F.O

FURTHER NOTES ON WINDING TRANSFORMERS

In his article, "Re-winding Transformer" ("A.R.," Sept. 1964), Ian Phillips has stated a way to determine the turns per volt of the windings. I do not wish to be unkind, but his method is misleading.

The turns of a 5 or 6.3 volt winding are not necessarily a multiple of 5 or 6 respectively. A power transformer is designed to give correct heater voltages on load (all windings normally fully loaded).

The following factors are taken into account to arrive at t.p.v.:—

Flux density (core loss),
Wire gauges (copper loss),
Increase in wire resistance with temperature rise,
The final estimated working temperature above ambient.

These determine the transformer "regulation".

A typical design of about 100 to 150 watts rating would probably use a core of the E and I waste-free type, either a 1¼" centre leg and 2" stack, or 1½" centre leg and 1½" stack. Core material is a matter of size and temperature rise, and can vary accordingly.

However, to get to the point, the heater winding voltages **off load** and therefore the turns depend on the factors stated earlier. This may be seen from the figures given in Table 1, and the same applies to other core sizes and areas.

Core Leg × Stack (Inches)	Appro. Net Area (Sq. In.)	T.P.V. for Flux in Kgausses*		
		10	11	12
1½ × 1⅜	2.1	3.3	3	2.75
1¾ × 2	2.3	3	2.75	2.5
Turns 5v. wdg.	→ 2.1	18 (5.46)	16 (5.32)	15 (5.46)
Turns 6.3v.wdg.	→ 2.1	22 (6.67)	20 (6.68)	19 (6.9)

Table 1.
Figures in brackets are typical "off-load" voltages.
* Multiply by 6.45 for K lines/sq. In.

It will be seen that a winding of 18 turns could be a 5v. or 19 turns a 6.3v. winding. Therefore, with a faulty transformer, it is a little difficult, if not impossible, to arrive at the t.p.v. If not faulty, the turns of the heater winding divided by the off-load volts will give the t.p.v. provided the correct voltage is applied to the primary, and the meter is reasonably accurate. (All secondary windings unloaded.)

The only other way is to assume a normally used flux density, e.g. 11 Kgausses or approx. 70,000 lines, and the t.p.v. is near enough to 6.8 divided by the cross-section area in square inches as measured with a rule. This gives you a fair chance of being "near the mark" or can be used for a complete re-wind.

—Andy Roudie, VK3UJ.

S.S.B. TRANSCEIVER

(Continued from Page 7)

POWER CONVERTER

A suitable power unit is shown in Fig. 21.

T1: primary 100 turns of 22 B. & S. secondary 50 turns c.t. of 22 B. & S. Core: Ducon Q1 toroid.

T2: primary 62 turns c.t., 16 B. & S. secondary (1), 600 turns c.t., 26 B. & S.; secondary (2), 100 turns, 26 B. & S. Core: Permalloy C core, 100 v.a. rating. Note: Core from APX-1.

A suitable control unit is shown in Fig. 22.

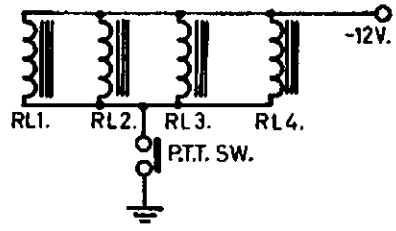


Fig. 22. Control circuit.

CONCLUSION

A complete transceiver has been described. Enough information has been presented to enable a transceiver to be designed for any frequency—3.5 to 144 Mc.—using Reporter components.

By building one's own along the lines indicated, it is possible to enjoy the advantages of transceiver operation at a small fraction of the cost of commercial units.

Finally I am indebted to VKs 3AHL, 3ADF and 3ZCZ for numerous suggestions which have proved invaluable during the development of this unit. ●

☆

D.X.C.C. CONTEST

"All the DX you can work in a year" is the object of the First Annual D.X.C.C. Contest being sponsored by the Long Island DX Association in order to stimulate DX activity throughout the world.

The Contest will begin at 0001 G.M.T., 1st January, 1965, and end at 0000 G.M.T., 31st December, 1965. Contestants will be required to work as many different countries over 100 as possible in order to be eligible for the special prizes which will be offered by the L.I.D.X.A. Any mode and any band may be used but just one confirmation from each country will count. The Contest will be based on A.R.R.L. D.X.C.C. rules and the A.R.R.L. Countries List will be followed.

The prizes to be awarded to the winners include the Long Island DX Association Trophy, going to the top scorer in the world; six unique trophies, one to be awarded to the top scorer on each of the six continents; and individual certificates to be awarded to the top scorers in each country from which entries are submitted as well as winners in each of the U.S.A., Canadian and Australian districts.

At the close of the Contest, participants will be required to submit just their lists of confirmed countries worked to "L.I.D.X.A. Contest," P.O. Box 599, Lynbrook, New York, with postmarks no later than February 15, 1966. Potential winners will be notified and will be requested to submit all their Contest QSLs to the Contest Committee whose members are: Joe Hellman, W2MES; Dorothy Strauber, K2MGE; Win Tames, WA2QNW; and Marv. Fricklas, W2FGD. A complete list of winners will be published as soon as the committee has completed the tabulation of the entries. For any additional information, contact the L.I.D.X.A. Contest Committee members via P.O. Box 599, Lynbrook, New York.

—VK4BS.

ROSS HULL MEMORIAL V.H.F. CONTEST, 1964-65

The Federal Contest Committee of the Wireless Institute of Australia invites all Australian and Overseas Amateurs and Short Wave Listeners to participate in this annual Contest which is held to perpetuate the memory of the late Ross Hull whose interest in v.h.f. did much to advance the art.

A handsome Perpetual Trophy is awarded annually for competition between members of the W.I.A. in Australia and its Territories, inscribed with the name and life work of the man whom it honours. The name of the winning member of the W.I.A. each year is also inscribed on the Trophy. In addition, this member will receive a suitably inscribed, framed photograph of the Trophy.

Objects: Amateurs in each VK Call Area will endeavour to contact Amateurs in other Australian Call Areas and Overseas.

Date of Contest: 12th December, 1964, to 10th January, 1965.

Duration: From 0001 hours E.A.S.T. (1401 hours G.M.T.) on 12/12/64 and 11/12/64 respectively, to 2359 hours E.A.S.T. (1359 hours G.M.T.) on the 10/1/65.

RULES

1. There shall be three main sections to the Contest:
   (a) Transmitting, Open, 52 Mc. and higher.
   (b) Transmitting, Phone, 52 Mc. and higher.
   (c) Receiving, Open, all bands, 52 Mc. and higher.

2. All Australian and Overseas Amateurs may enter for the Contest whether their stations are fixed, portable or mobile.

3. All Amateur v.h.f. bands may be used, but no cross-band operating is permitted.

4. Amateurs may enter for any one of the transmitting sections. All contacts must be consecutively numbered in the one number sequence to facilitate checking.

5. Only one contact per band per station is allowed each calendar day.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. **Cyphers**: Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of 5 or 6 figures will be made up of the RS (telephony) or RST (c.w.) report plus three figures commencing from 001 for the first contact and will increase in value by one for each successive contact. If any contestant reaches 999 he will start again with 001.

9. **Entries** must be set out as shown in the example, using only one side of the paper. Entries must be postmarked not later than one month after the Contest (i.e. not later than 10/2/65) and be clearly marked "Ross Hull Memorial V.h.f. Contest, 1964-65," and addressed to the **Federal Contest Committee, W.I.A., Box 638J, G.P.O., Brisbane, Queensland.**

10. **Scoring** for all sections will be based on the attached table. Contestants will have to agree between themselves as to the distance between their stations. Such distances must be shown in their log entry in the column usually used for remarks or bonus points.

11. **Logs**: All logs shall be set out as in the example and in addition will carry a front sheet showing the following information:

Name.....Call Sign.....

Address.....Section.....

.....Claimed Score.....

Declaration: I hereby certify that I have operated in accordance with the Rules and Spirit of the Contest.

Signed.....

Date.....

Note: Entries on the front sheet must be clearly shown in block letters.

12. The right is reserved to disqualify any entrant who, during the Contest, has not observed the regulations or who has consistently departed from the accepted code of operating ethics.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No dispute will be entered into.

14. **Awards**: Certificates will be awarded to the winners of each section in each VK and Overseas Call Area. The VK contestant who returns the highest score in the transmitting sections and who is a financial member of the W.I.A. will hold the Trophy until the next Ross Hull Contest is decided, and in addition will receive an appropriately inscribed photograph of the Trophy.

GENERAL

Several suggestions were received regarding the duration of the Contest being too long. It was suggested that the period of the Contest remain the same, but that contestants submit a log for a seven or nine-day period of the Contest. This period would be selected by the individual contestant. Before taking any steps in this direction we would like to have a much wider expression of opinion on this matter and comments are invited.

It is suggested that contestants obtain a large scale map of Australia and of their State and mark on these maps the radial distances from their location in accordance with the scoring table.

RECEIVING SECTION

1. Short Wave Listeners in Australia and Overseas may enter for the Contest, but no transmitting station may enter.

2. Contest times and logging of stations on each band are as for the transmitting sections.

3. To count for points, logs will take the same form as for transmitting sections but will omit the serial number received. Logs must show the call sign of the station heard (not the station worked), the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations. It is not sufficient to log a station calling CQ.

4. A station heard may be logged only once per calendar day on each band for scoring purposes, but additional reports will be of value to the F.C.C.

5. **Awards**: Certificates will be awarded to the highest scorer in each VK and Overseas Call Area.

SCORING TABLE

Distances Between Stations	52 Mc.	144 Mc.	420 Mc.	576 Mc.	Higher
Up to 10 miles			1	1	5
Over 10 and up to 25 miles			2	2	10
Over 25 and up to 50 miles			10	10	30
Over 50 and up to 100 miles	4	2	20	20	60
Over 100 and up to 200 miles ...	10	4	30	30	80
Over 200 and up to 300 miles	20	10	40	40	
Over 300 and up to 500 miles	10	16			
Over 500 and up to 1,000 miles ..	2	30			
Over 1,000 and up to 5,000 miles ..	10	40			
Greater than 5,000 miles	20	50			

EXAMPLE OF TRANSMITTING LOG

Date/ Time	Band	Emission	Call Sign	RST/NR. Sent	RST/NR. Rcvd.	Distance	Points Claim.	Blank

NOTE.—State whether Time is E.A.S.T. or G.M.T.

EXAMPLE OF RECEIVING LOG

Date/ Time	Band		Station Heard	RST/NR. Sent	Station Called		Points Claim.	Blank

NOTE.—State whether Time is E.A.S.T. or G.M.T.

SIGNALS SERVICE COURSE

Held at Macedon, Vic.

The No. 2 Signals Service Course, held at Macedon, Vic., from 6th to 11th September, was attended by 30 members, of these 20 were Amateurs

Present were: P. A. Alexander (VK-2PA), J. B. Battrick (VK3OR), K. V. Benwell (W A.), L. Blagbrough (VK-4ZGL), S. Briggs (VK4SC), T. I. Cairnduff (Tas.), G. C. Casboult (Tas.), Major E. Collett (VK2RU), H. P. Fuller (VK8TF), M. W. German (VK4ZGM), R. G. Harris (VK5RR), R. H. Hildred (VK4RE), Sergeant R. G. Holdway (Qld.), T. A. Holmes (Vic.), P. B. Jackson (VK2ZPJ/T), C. E. Love (N.S.W.), M. J. McDonald (VK6MM), M. M. McGrane (VK4MZ), B. A. McRae (VK-5MC), P. L. Mahan (VK3AOY), L. A. Maschette (VK6ZDM), D. E. Melbourne (VK2NK), G. A. Middleton (VK5GO), R. A. Murphy (VK5ZDX), M. J. Owen (VK3ZEO), Rev. Bro. T. Radcliffe (N.S.W.), R. V. Saunders (N.S.W.), Major R. L. Topp (VK3QT), B. E. Wearne (N.S.W.), E. W. West (W.A.).

It is the first time that a course has been attended by so many people with a hobby as a common bond. The others are all connected with communications in some form or another.

The purpose of the course is to instruct the members of the duties of Signals Officers for the Civil Defence Services in Australia.

A background of nuclear, biological and chemical warfare was given.

Message writing, field telephones and cable laying, signal centre duties and records, raising and training personnel, radio procedure and exercises, and planning radio exercises were covered by the course.

One of the major factors evolved from this course was that no matter what form of communications you are using, the procedure in message handling must be standardised, so that confusion does not arise. A badly controlled and confused communication system is worse than no communications at all!

With the development of Civil Defence in the various States, Amateurs may be required to assist in the training and operating Civil Defence Signals Sections. We must attempt to get the most from our members who are attending these courses and there will no doubt in the future be others attending similar courses.

We all know that communications are the backbone of any service, be it private, public or civil. These Amateurs and the others are doing their best to prepare for natural and other disasters. What are you doing? Contact your local W.I.C.E.N. Co-ordinator and offer your services.

—Alyn Maschette, VK6ZDM.

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NEW CALL SIGNS

JULY, 1964

VK1AXX—J. W. Hutchinson, C/o. Department of External Affairs, Administrative Office, Parkes, A.C.T.
VK1EM—E. J. Mulholland, Flat 11, Block 14, Northbourne Flats, Braddon, A.C.T.
VK2UU—G. A. Sangster, 23 Hollis Ave., Goulburn.
VK2BAE—D. C. Boundy, 201 Kennedy St., Armidale.
VK2ZFE—F. W. Alpin, Banksia St., Orange.
VK2ZFK—R. Bowden, 40 The Grove, Mosman.
VK2ZJI—A. J. Jones, 10 McAllster Ave., Engadine.
VK2ZMM—J. P. Mack, 78 The Crescent, Cheltenham.
VK3LL—M. W. Busch, 72 Goold St., Bairnsdale.
VK3ACT—J. Cutts, 648 High St., Kew.
VK3AIV—N. O. Duncan, 13 Kenbry Bd., Heathmont.
VK3ANR—Geelong Radio and Electronics, Guild Hall, Myers St., Geelong.
VK3ZCN—A. F. Leversha, Harcourt.
VK4ZLL—L. Labruyere, 157 Warry St., Fortitude Valley.
VK4ZPW—W. Spring, St. Leo's College, St. Lucia.
VK4ZTT—T. C. Thompson, Boys' Grammar School, Rockhampton.
VK5FA—E. F. Brandon, C/o. Dpt. of Civil Aviation, Oodnadatta.
VK5UJ—J. S. Burns, 4 Arthur St., Whyalla.
VK5QM—M. W. Higgins, 15 Beta Cres., Panorama.
VK5ZBS—G. Downing, 4 Bella St., Gawler East.
VK5ZDA—D. M. J. Bates, 23 Alison Ave., Blackwood.
VK5ZJD—J. E. R. Dunkley, 54 Radstock St., Kilkenny.
VK5ZOF—G. C. Adams, 225 Shepherds Hill Rd., Eden Hills.
VK6ZEH—G. D. L. Armstrong, C/o. Station 6WA, Wagin.
VK6ZEM—B. M. McDonald, Station: Munthoola Farm, Williams; Postal: P.O. Box 47, Williams.
VK9BJ—B. J. Mennis, P.O. Box 81, Rabaul.
VK9PL—J. G. Porter, C/o. Eng. Branch, Posts and Telegraphs, Port Moresby.

R.S.G.B. 21-28 Mc. TELEPHONY CONTEST—DECEMBER 5-6, 1964

Radio Amateurs throughout the world are again invited to take part in the annual R.S.G.B. 21-28 Mc. Telephony Contest to be held this year on December 5-6.

Attention is drawn to changes in the scoring system described in detail in Rule 8. Contestants are advised that in previous years many points were lost by those who did not read this rule carefully.

Duration: The Contest will start at 0700 G.M.T. on Saturday, December 5, and end at 1900 G.M.T. on Sunday, December 6, 1964.

The Contest is open to licensed Amateurs in all parts of the world.

Contacts may be made using any telephony system for which the entrant is licensed. Only one contact on each band may be made with a specific station, whether fixed, portable, mobile or alternate address. Duplicate contacts must be logged and clearly marked as duplicates without claim of points.

Contest Exchanges: An exchange of RS reports followed by a three figure serial number starting with 001 for the first contact and increasing by one for each successive contact.

Entries: (a) should be clearly typed or written on one side only of foolscap or International A4 size paper; (b) must be ruled in columns head (in this order) (i) Date/Time (G.M.T.); (ii) Call Sign of Station Worked; (iii) I sent him; (iv) He sent me; (v) Band; (vi) Bonus Points; (vii) Points claimed; (c) must be addressed to the Contests Committee, Radio Society of Great Britain, 28 Little Russell St., London, W.C.1, England, the name of the Contest being clearly shown on the top left hand corner of the envelope, which must be postmarked not later than December 21, 1964.

Rule 8. Scoring: Overseas stations may only claim points for contacts with British Isles Stations (G, GB, GC, GD, GI, GM and GW). Overseas scoring will be as follows: Each completed contact with a British Isles station will score 5 points. In addition, a bonus of 50 points may be claimed for the first contact with each British Isles country-numeral prefix on each band. A further 50 bonus points will be scored for every ten stations worked in each of the above categories irrespective of band.

Certificates will be awarded to the leading station in each VK call area.

The usual cover sheet and declaration must accompany each log.

D X

VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

As we predicted last month the bands really have gone for the big change and 20 metres has gone for the complete reversal with regard to W and Europe, Asian and Russians areas. Whether these conditions will remain as of time of writing is hard to say, but inside two very short weeks the change is phenomenal. Times shown below are times of maximum sigs from each area, and is variable day to day.

160 Metres: The only report here is not actually the DX type, but Ray VK2HC will be pleased to hear that his sigs were being received at Rockhampton at 5/7-8 by Charles Thorpe, WIA-L4018.

80 Metres: Early mornings on c.w. at around 2200z some Europeans are workable, whilst in the early evenings approx. 1030z on the low end, JAs, etc., can be heard at reasonable strength. On the high end DX portion, VR2, ZL, etc., can be contacted on s.s.b.

40 Metres: Around 7.1 Mc. each day at approx. 0700z, G, GI, etc., are workable along with OA, YV, etc. An occasional ZS and ZE can be heard working but sigs are not strong from Africa. 0830z the band opens to the East for KH6 and the associated islands, plus W for a couple of hours. An hour or so later the islands to the north are there with good sigs. Most of the activity is for s.s.b.

20 Metres: Some contacts to Europe in the early hours local time, during the morning hours a.m. an occasional South American with Antarctica coming in strong. W, XE and VE stations have practically disappeared in the afternoons. 0700z sees some activity from Africa. 0800z sees KL7 area, whilst from 1200z the short path to Europe, Asia and Russian areas are really jumping. This continues most nights until about 1430z.

15 Metres: A little more activity especially during week-ends, but mostly North-South path around midday.

10 Metres: Garry is reported to have worked a couple of JA stations. How about we give these latter bands our attention soon? They are more usable than most would think, with a bit of activity here, it would be surprising what might happen.

ACTIVITIES

Just digressing for one short moment, might I say thanks to the boys on a.m. whom I worked on s.s.b. during the R.D. Contest. The co-operation of the two modes worked well, not one station I called refused to answer and the quick answers to each call was good to hear. I'm sure I speak for a lot of fellows in this regard.

Heard Stewart VK5MS calling and calling W7GNP for special reasons on 20, with no return, but who was there to answer the call, W6GNP. Ken always looks to VK after mid-night W time for contacts he really enjoys.

TI3AA, Arnoz, is on week-ends 14120 kc. s.s.b. QSL to Box 4589, San Jose, Cr.

Charlie FO8BL on a.m. approx. 14100 kc. QSL to Box 45, Papeete, Tahiti.

A quick tune over 14 Mc. covering about 20 minutes revealed the following calls and all workable strength: CR7, 7Q7, KH6, HK3, FO8, TI3, JA1, KG6, KL7, KJ6, etc.

HK3AUE is on s.s.b. most Sundays 14100-14140 kc. QSL to Box 6070, Bogota, C.

David HR1RP looking for VK contacts at 0530z with excellent signals from HR at the moment.

ZS6NE, possibly the most consistent from his area, can be heard almost daily on the low end of 14 Mc. s.s.b.

KC4 stations are building up in strength but carry on a lot of phone patch work with the Ws.

Lots of weak carriers trying to break through on 15 metres during the daylight hours.

VR2EN heard in the DX portion of 80 mx chatting with ZL.

ZE1AYZ was also heard on approx. 7094 kc. at 0740z on s.s.b.

Joe operating 4U1ITU is a Scot who knows all the Adelaide and Elizabeth gang in VK5. Will be returning to Glasgow soon.

FB8WW still very active on 14 Mc. c.w. from 0500-1200z with a T7 note still.

VU2NR hopes to be portable in VU5 this month.

KS6BA and KS6BL can be heard on 14230-285 kc. at 0630 and 0830z.

LU1ZC and LU8ZI are on Deception Island on 14 Mc. c.w. about 1200 and 2200-2300z.

UA1CT is /UJ8 on 14108 kc. s.s.b.

GC2FMV is on 14020 kc. after 1200z.

FK8AB is on 7008 kc. c.w. after 1200z.

LA2BJ/P on Jan Mayen c.w. 14055 kc.

FO8BJ on 14110 kc. s.s.b. at 0600z.

KG6SB and KG6SZ are both on Saipan at the moment.

Heard Pete VK5FM working KC4USS/MM near the South Pole, aboard the Mills, which is heading on a round the world tour, while maritime the station is operated by WA2WAI whose home QTH is near Rhode Island. Once they get away from the base down south, they will revert to the operators home call plus MM.

YA1BW-1AN are both keen c.w. men and can be contacted on 20 from Afganistan around 1430z.

JA0BP is on s.s.b. and hails from Kransnojarsk, U.S.S.R., and is in Zone 18. Runs 200 watts to a quad antenna.

K4LSI and K4LIS are mother and son from the state of South Carolina.

EP2AO and EP2DM are active from Iran. Some times are heard around 1330z.

George VK5RX appears to be very jubilant over the change in conditions, the long path to W on both 40 and 20 mx being very good at his QTH.

OX3JV is old OZ7JV from Denmark, and now at Greenland using s.s.b. on 14 Mc.

SL6BH is the training centre of the Royal Swedish Air Force, and is operated by SM6-CKU. They are using a HX500 at 100w. with a hl-gain vertical and the hearing aid is an SX101A.

FH8CD is a good contact and a number of VKs have made contact on s.s.b. or c.w. Operator is Andre Lienard and is located at Domaine de Patsy, on the island of Anjouan, in the Comores group. His frequency is 14275 kc. on s.s.b. He uses an HX50 Tx, Drake 2B Rx, and a beam antenna. QSL direct or via the R.E.F. society in France.

HS1X is another on s.s.b. running 45 watts. He is Andy W1FAX and is with the U.S. Embassy in Bangkok, Thailand.

VS6FC, of Hong Kong, formerly G3LSW, puts in a good signal with 30w. and a dipole.

W2AOO is with the U.S. Army Engineers in Korea and is now using the call sign HL9TO.

9Q5HF is the Rev. Edward Schuit, located on the shores of Lake Albert, at Linga, in the African republic of Congo. He is up 7,000 ft. and two degrees off the equator. Uses a Viking Tx and a quad.

JAs most prominent in the Asian Contest were ICG, IBWA, 2CMD, 3FT, 5HD, 6AA, 7MN and 8JAM.

Some of the best cards received this month through the VK5 Bureau are as follows: FB-8XX, YV1AD, 5A1TW, SM2BCS, VE2WY, F8TV, F3ZU, UI8LB, KR6BQ, KH6OEF, VR2DK, UB-5KST, CR6DB, OA4PF, VQ8BM, EP2AV, 4X4MR, YO2CD, HC1DC, ZM7AD, ZS3HT, HB9MU, OK1WV, YO7DO, UA2KAE, UI8AG, UW0IF, UB5KBA.

Peter Drew, WIA-L6201, sends in a comprehensive report from the West and shows that most of the boys should be having some fun over there. Peter says he heard his first Ws on the long path on 80, both c.w. and s.s.b., some of the stations logged were W1IZY, K3EKO, K2BZT, W4IHK, W1CBV, VE3AWE, W2LV. The strongest was about an S5, these were heard from 2215-2300z. At the same time on c.w. DJ7FC, 5Z4IV, UO5GW and VQ2DT (who was S8-9). Other DX on 80 has been from 0930-1130z and is all s.s.b. as follows: KH6FIZ, VE3BWY, VE3BHQ, W0LEJ, W5KFD, K5FRG/5, W2BIQ, W1AWY, W1BU, W6BBH, VR2ES, WB6GZK, W4BUR, WA5EFL.

On 40 mx Peter says there are loads of Europeans and Africans between 1700-2300z, while Ws are very good at 2200-2400z and 0900-1300z. Occasionally G8PO or G3AOO get through but are very weak. Best on 40 c.w. is OR4VN, VE3BLU, 9Q5AB, FB8YY, ZS5QU, ZE1BF, UQ2KAA, YO5LP, VQ2DT, G3PEK, HB9AEO/P, while on s.s.b. 9Q5AB, SM8VR, OH2AM, G3AOO, WA7AJB, HK5AUG (0818), YV5BKW, XE2CW, VP8KL.

The best on 20 mx c.w.: FR7ZD, FB8WW (0625), OH4QG (1429), ZA1FL (1428), ZC5FS (1423), AC5CP, UH8KAA, 9M4LD, MP4BEQ (0659), UA2KAK (1317), VE2BCT (1151), UM-8AP, SM7QY (1652), UA1KAE (Mirny Base Ant., 0806).

On 15 mx: W6JRY very weak on a.m. at 0300. Tnx a lot, Peter.

Ken VK3TL reports the 20 mx band is really open to Africa during the afternoon from about 3 p.m. Vic. time. Ken has worked the following on s.s.b.: CR6GO, CR6GQ (a.m.), CR7GF, HC1EB, HC5NW, HR1RP, TI3AA, VQ2RB (a.m.), 9M4JW, ZC5AM, 7Q7GN. 20 mx c.w.: TF3AB, HM5CO, HP1MN, SP0RF, IT1PST, JT1KAA. Ken's best QSLs for the month: LX3MZ, WA4 JXV/VO2, AP2AP, CR7GF, AC7A, VR5AA, 5A3TX, ZS7R, FO8AQ, YN1LH, CX3AA, CX-1NE, CE3AA, TF3AB.

Some QTHs: SP0RF, via SP9RF. ZC5AM, Box 777, Singapore. 7Q7GN, Box 700, Blantyre, Malawi Republic. HR1RP, U.S. Army Mission, C/o. U.S. Embassy, Tegucigalpa, Hon. Many thanks Ken.

From George VK5GG, all on 20 mx s.s.b. and all short path: OE2EGL, G3IWV, 1T1TAI, MP4BBW, G3WW, SV0WGG, 7Z3AB, DL5DR, G3AJX, DL8DX, OZ9SL, UA6XG, G3PCI, SM-2BJI, G8JM, SM5CSL, UA4CB, UWIOL, OX-3JJ, UM1MO, SM1AS, G2FSP, G3AOO, KC4CK, OA4J, VR2BC, YV5BKW, UA1CK, SM6AYC, XW8AX. LA8LF, OH6AF, F9UC/FC, ZS6N, ZE2JE, I1RB, CR7GF, ZS1J, ZS8N, UA8CAA, ZE6NE, ZE4JO, ZS6BO, ZS4PU, KR6OJ, G5FI, G3KOM, SM5CO. 9M2DQ, ZS4U, OZ8RA, DJ-8CB, UO0PK, 1T1TAI, W, KL7, JA, etc., not listed. (It's taken a long time George, anyhow thanks, I'll come down and peak that quad for you, hi.)

Keep an eye open for "France" from the 14th November from Rodrigues under call of VQ8AMR, transmitting a.m. and s.s.b. in the 14 Mc. region.

SV0WGG: QSL to C/o. K1EAT.

Also happy with the change in DX conditions is Garry 5ZK, who reports working the following on 14 Mc. s.s.b.: VS6AJ (1130), HS1S (1145), OZ6OP (1230), 9M4JW (1330), 4U1ITU (1345), G3PCI (1345), UA4AR (1400), DJ8RR (1400), HC5NW (0400), 9M2DQ (1045), Ws 2-3 (1245), ZS4OI (0500), XW8AX (1230), OH6WY (1232), G8UG (1230), G3IWV (1230), MP4BEQ (1330), HS1BD (0930), ZC4GT (1000), VQ8AM (0815), 9M2LO (1130), G3EIN (1230), SM4AMP (1300), I1ZMJ (1300), G3SOC (1315), CT1IP (1330), ZS4JB (0500), XW8AL (1130). On 21 Mc. a.m. and s.s.b.: JA1-0, W5-6. 28 Mc. at 0300 JA3DEA, JA3CXN. Tnx Garry.

So that's it fellow Hams. Things are definitely looking better. Thanks to the following: Peter Drew, Garry 5ZK, George 5GG, George 5RX, Ken 3TL. See you next month. 73, Bert VK5BB.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK5MS	24	306	VK2JZ	61	217
VK6RU	2	303	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6MK	43	293	VK3ATN	28	204
VK3AHO	51	289	VK4HR	12	192
VK4FJ	21	280	VK4RW	23	188

C.W.

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK3KB	10	328	VK6RU	18	260
VK3CX	26	304	VK3AHQ	79	248
VK2QL	5	301	VK3ARX	68	242
VK4FJ	29	296	VK3XB	75	238
VK3NC	19	288	VK2EO	2	234
VK2AGH	71	267	VK3YL	39	231

OPEN

Call	Cer. No.	C'nt-ries	Call	Cer. No.	C'nt-ries
VK6RU	8	309	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	300	VK7LZ	23	242
VK6MK	74	295	VK2VN	18	235
VK3AHO	78	294	VK4HR	7	233

V H F

52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

The following letter from John Lee, W6YKS, contains some interesting news from U.S.A. and is published herewith:

"I just received a copy of your Ham magazine, 'Amateur Radio,' and am glad to see that Hams in other places on the world have not given up on v.h.f. Also find it very interesting that you are using the u.h.f. frequencies. They are not in wide use here in the U.S.A., considering the number of Hams here.

"We also have the television problem on 50 Mc., but it isn't because the t.v. station is inside the Ham band. Our lowest channel is Channel 2 (54-60 Mc.).

"There are quite a few Hams on 50 and 144 Mc. all over the country. Now that the sunspot cycle has gone to a minimum, and band openings are few and far between, some of the Hams have gone to working tropo and meteor scatter for DX. The best time for this propagation seems to be early in the morning 0600 to 0900 local time, and the best path seems to be north and south. Distances of around 1000 miles are not uncommon for the high power stations. However, I only run 250 watts input with a single 4-125A (4D21), and have an eight element beam up about 40 feet. So far my best scatter DX is San Francisco (about 275 miles). Other stations work consistently distances such as from Los Angeles to San Francisco and from San Francisco to Seattle, and Portland, Oregon. On 'skip' openings, of course, you know what can be done.

"Well some day the sunspots will be back and maybe we will have a QSO on six. I will be there as I leave the six metre receiver on most all the time I am awake. Also, if you are interested, we have many antenna and rig designs available here and would be glad to share them with you. For now, good luck and DX."

John's address is P.O. Box 472, Fortuna, California.

As VK2 and VK5 notes have not been received for some time, would these Divisions please consider a new correspondent? 73, 3ZGP.

LATEST LIST OF V.H.F./U.H.F. RECORDS FOR AUSTRALIA

50 Mc.:—
VK3ALZ-XE1FU—1/5/59—8,418 miles.

144 Mc.:—
VK2ZKP-ZL1ADE and ZL1AUM—24/12/63—1,351 miles.

432 Mc.:—
VK3OB/3-VK3ZAV/3—19/1/64—97.3 miles.

576 Mc.:—
VK6ZDS/6-VK6LK/6—15/12/63—101.2 miles.

1215 Mc.:—
VK2ZAC-VK2ZCF/2—4/3/63—46.8 miles.

2300 Mc.:—
VK3XA-VK3ANW—18/2/50—9.0 miles.

3300 Mc.:—
VK3ZGT/VK3ZGK/3-VK3ZDQ/3—14/12/63—63.5 miles.

THE BEACON BOX

VK5VF—

6 Metres — 53.000 Mc.

2 Metres — 144.800 Mc.

One call on c.w. then carrier for 40 seconds, then repeat, etc. Operation is almost continuous.

VK6VF—

6 Metres — 52.006 Mc.

2 Metres — 145.060 Mc.

Automatic c.w. identification with approximately four seconds key-down position. Operation is almost continuous.

VK3: ATV0—

51.75 Mc. f.m.

0900 — 2300 hours daily.
(100kw. e.r.p., 2600 ft. elevation)

VICTORIA

This past month has seen a rise in activity on the bands as winter's long and cold nights are giving away to longer and warmer days. The advent of the warmer nights have given impetus to a return to the shacks. New call signs (and older) are appearing each week. There is an increase in the users of the net frequencies since the "Activities Day" on 13th Sept. in Victoria. The 53.032 a.m. net is receiving quite a lot of attention and some 40 odd stations have been logged on this channel. The f.m. net on 52.525 Mc. is slowly picking up. There is a small supply of 70 Mc. f.m. mobiles coming on the market here and they are being snapped up.

The really keen 6 mx enthusiasts are working on their gear, ridding themselves of Channel 0 problems. With luck quite a few of the regulars will be getting amongst the DX during the Ross Hull Contest. Other States should catch the Melbourne gang probably down the low end of the band during non-programme (test pattern) hours and then higher in the band during regular programme times. Approx. 3.30 p.m. onwards (except for special events) Channel 0 will be programming. Approx. 9 a.m. onwards is test pattern time.

From comments quite a few fortunate ones have no problems, however as the activity increases, no doubt so will the problems. Most of us will be using vertical polarisation to minimise possible problems.

Two metres is showing quite an increase in activity. The field day season will commence in October and take place on the third Sunday of each month except Feb. which will coincide with the National Field Day. Same rules as last year will apply. There promises to be more activity on this band this season.

432 Mc. has attracted quite a following with some 12 or so enthusiasts. Just recently a 136 mile two-way was made between 3ZER/P and 3OB/P. We trust the Amateurs concerned will make a claim for the record—anything to pass the distance?

1296 Mc. has interested a few here in Melbourne and I believe in Geelong. 3AUX has a really "hot" converter with cavities constructed from a well known brand of mustard tins. We gather the expression "not worth 2 bob" can't apply here also as we have seen the unit and can vouch for the fact that there is more than "2 bobs" worth of silver in it.

It is hoped soon to produce a "V.h.f. Newsletter" in VK3 and if our plans are realised we hope to keep more in touch with you per this media. Having seen both the VK2 and VK6 varieties, we have no illusions that it won't be hard work. Here's hoping for success. 73, 3ZGP.

VK3 52-54 Mc. stations and frequencies from the Melbourne area, supplied at the request of other VK Divisions: 52.02: 3ZNJ; 52.06: 3QO; 52.104: 3ZGP (fixed and mobile); 52.20: 3ZCO; 52.36: 3ZNJ; 52.37: 3ZIX; 52.525 f.m. net: 3BX, 3AAA, 3AAF, 3ZCK, 3ZDP, 3ZEL, 3EM; 52.58: 3ZCO; 52.65: 3ZDO; 52.66: 3ZPA; 53.00: 3WI stand-by freq.; 53.032 a.m. net: 3WI, 3BX, 3EM, 3KU, 3RN, 3UU, 3YS, 3ABP, 3ADF, 3AFJ, 3AFU, 3AHZ, 3AIJ, 3AKB, 3ALK, 3ALZ, 3ATP, 3AZT, 3ZBN, 3ZBR, 3ZCB, 3ZCE, 3ZCK, 3ZCM, 3ZCO, 3ZDC, 3ZEP, 3ZGD, 3ZGP, 3ZIY, 3ZJF, 3ZNJ, 3ZOL, 3ZOQ, 3ZPC, 3ZRH, 3ZSH; 53.14: 3ZGP; 53.32: 3ZPA; 53.40: 3ZCK; 53.72: 3ZCK, 3ZPB, 3AK, 3AEF, 3AFU, 3ZNM; 53.81: 3UU, 3ZCO; 53.82: 3ZML, 3ZPA; 53.84: 3ZGM; 53.88: 3ZCO. The following stations are v.f.o. or v.x.o. controlled: 3IM, 3UU, 3KC, 3AHL, 3ALZ, 3ASG, 3ZFC, 3ZHF, 3ZLC, 3ZOM.

Most of the stations in the above list are very active. The equipment used in the 53.032 Mc. net is mainly Pye Reports (Mk. I., II., III.) using respectively 6J6, KV04/7, and 3/12 finals, with inputs of 5, 12 and 15 watts. These units have car-to-car range of 5-10 miles in the city and up to 40 miles across country, but the freq. of the tx must be plus or minus 500 cycles. The rx's should be accurately tuned also. The antenna commonly used are quarter wave whips on mobile, ground plane, vertical beams, and coaxial antenna for home or base stations.

A few chaps have had t.v.i. problems. The main ones being front-end overload and oscillator harmonics getting into the i.f. strip. The first trouble is easily cured by fitting a 4 ft. length of 300 ohm feeder on the antenna terminal of the t.v. set and trim down until picture and sound are restored. The final length varies between 44 and 46 inches, depending on the length of feeder between the antenna terminal and the tuner. The harmonic trouble can be cured by fitting a series tuned trap in the grid of the multiplier stages in the transmitter. Tune the trap to the unwanted harmonic that is causing the trouble, which is usually between 30 and 40 megs. The same system works on 144 megs to prevent interference to Channel 5A.

V.h.f. Convention. The V.h.f. Group held their Convention on 10th and 11th October at Ferny Creek in the Dandenong Ranges, about 25 miles east of Melbourne. It was quite a success and it is planned to hold more in the years to come.

V.h.f. Group Meeting: The last two v.h.f. group meetings (which are held on the third Wednesday of each month) were given over to talks on f.m. with a display of some commercial equipment, which many VK3s have been converting to the local nets on 145.854 and 146 megs.

Two Metre Beacon: Planning is well under way for this beacon. It should be operating in the new year. The proposed frequency is 145.00 megs. The VK3 6 mx beacon on 51.75 megs. (ATV0 is of 20kw. e.r.p.) is f.m. and operates between 1100 hrs. and 2300 hrs. daily. The antenna has two nulls—one is in the Wagga Wagga direction, and the other in the Brisbane direction. Reports to hand show that is it very strong in some parts of New Zealand—to the effect that it blotted out their Channel 1 in Wellington a little while back. A local daily newspaper reports that the managing director of the station can watch Channel 0 at his holiday home in Hayman Island with an ordinary fringe area antenna and an unmodified commercially available t.v. rx. 73, 3ZCK.

QUEENSLAND

Signals which have been absent from the bands during winter are gradually beginning to re-appear with the approach of the summer months. It seems that some of us either undertake a re-building programme during winter or just plain hibernate. Bands have been continually active last month and many enjoyable contacts have been had.

A continuing stream of new voices have been heard on the bands. Lately it seems that many of the local low-banders have found that the very high frequencies are relatively free of noise and interference. Merv. 4MW, from Ipswich, has been working crossband, 6 to 80 mx, until he can become fully operational on 6 mx. Paul 4UL has been convinced that he should make a noise (Roy 4ZRM did the convincing). Even "gravel voice" Claude 4UX from up north was worked on 2 mx recently. With him was Charlie 4UC, who is heading the Youth Radio Scheme here in Queensland. Both these fellows spoke via the station of Bruce 4ZCM.

While not chasing sidebanders on 20 mx, Reg 4VX has been having plenty of discussion around his favourite subject of aerials on 6 mx. Low power mobiles are now a thing of the past as Reg runs 8 watts to his 6J6 with no melting tendency of the valve. Also I have heard that 4WF is going mobile on 52 megs.

George 4ZLG was quite astonished recently to hear a couple of low banders using fixed frequency f.m. well above 53 Mc. George wound his v.f.o. up to their frequency and broke in. They were most mystified when George's carrier caused a heterodyne but his modulation was completely removed by their limiters. However, contact was finally established and explanations followed.

With all this talk of full licence operators, I assure you that the Z calls are still active and have not as yet been overrun. Frank 4ZAS is using his new v.f.o. to best advantage and has just obtained an AR7. Frank has now retired from work and his voice is being heard more often on the bands now. Alf 4OL, who is better known as 4WI, has been on holidays and he was told before he left, "don't catch too many and save a lump of shark for Bill."

Tom 4ZAL made many calls during his recent holidays. He met quite a number of Hams down in Southport who are interested in v.h.f. John 4RZ, Bill 4WS, Arthur 4FE, Doug 4ZDL and Bob 4SR all send their 73 and will be pleased to meet any of the boys who venture down that way. Doug will be shifting his QTH to the Wondai area as he has been transferred.

Arthur did tell of his many efforts trying to make contact on 6 mx from Normanton to New Guinea when he was stationed up there. He used to call CQ VK9 quite a bit but could not break through. While on the subject of VK9, someone please tell Paul 9ZBV that he can come back and use his old call sign since they have decided to close down the office just down the tramline from his Brisbane QTH!

News from the Bundaberg district indicates that there are now four 6 mx stations in a nightly hook-up. It seems John 4ZMJ is thinking of a 50 ft. mast and Roy 4ZWR and Bill 4ZWS have been working on a tx and two super-regen. rx's for 2 mx.

The Ipswich Amateur Radio Club seems all set to appear on 6 mx. They intend to apply for a club call sign, but at the moment they will be using the call sign of Warren 4GT. Bill 4WD will be putting in a v.h.f. signal from Ipswich in the near future. Bill has accepted a position at the local b.c. station.

Victor 4ZBT has not been the best. He has had quite a stay in hospital and by the time this is published we hope that he has well and truly recovered. Lawrence 4ZLL has been heard using a taxiphone on 6 mx—welcome to the bands OM.

John 4ZWB in Dalby has been having a good time on 144 megs. While calling Bert 4CF in Toowoomba, he was called by 2WQ in Grafton. Not a bad effort for 250 miles on 2 mx! By the time the v.h.f'ers say congratulations to David 4ZEK for taking out the VK4 honours in the last Ross Hull Contest, it is just about time for the next Contest. Anyway, David well done.

I had words with Jim 4ZRA who hopes to be on the bands soon. Certain stations have already been using certain phonetics for his call sign, but these cannot be published or broadcast. What did you say about Rosy Apples Tom? Ross 4ZAT has been calling from Bribie Island on 144 megs. He was in doubt about the efficiency of his gear until someone heard him crying out in the wilderness.

If recently you heard the "Duke of Deagon" calling swing corners, promenade, ladies to the centre . . . do not think the worst had happened as it was only a dance in progress. The grape vine has been very active lately and along it came the news that local Hams of one of our northern towns are very busy with Amateur t.v. Further, who was the v.h.f. station liestening to 4OL mobile on 40 mx when he should have been up tuning 6 mx? I hope the Jamboree on the air v.h.f. wise was a big success. It should have been with all those stations operating. 73, 4ZPL.

WESTERN AUSTRALIA

The field day over 12th-13rd Sept. was a big success. Lance 6LR tried to reach a trig point 7 miles east of Bindoon but wound up in a field exercise being conducted by some branch of the services. He got the password eventually for he was on the air for the 1 a.m. session. He called several stations who never came back and would like you to swing the beam north next time. Ken 6ZBT had trouble with a 2k.v.a. motor alternator. Its big end and main disintegrated due to using wrong oil. Trevor 6ZCA had a squashed petrol tank due to bad road near his Dwellingup site. The winner looks like Ken 6ZBT with 12,430 points, followed by Charles 5LK 11,770 points. Andrew 6ZCW, in Bunbury, won the home station section with 7,725 points.

The fox hunt on 19th Sept. was won by Doug 6ZDW and Graham 6ZDB second by a matter of seconds. 6LR was bogged for two hours in a swamp nearby. He saw a red parking light on the next hill and gave her the gun. Only it was the wrong approach road and the swamp was a pretty good bunker. Roy 6ZBD managed to extract him after they found the aerial poking through the water. The fox was well hidden and quiet too, using a vibrator p.s. Just as well, for a goon mob had chosen the site for a beer-up, despite miles of surrounding bush in the South Riverton area. Each hound had a raucous welcome and needed some extra guidance as the tone had failed. Supper was at Bill 6ZBJ's residence. 73, 6ZAG.

☆

YOUTH RADIO CLUBS

There is a new aspect to our clubs which your members should find exciting. It concerns the Duke of Edinburgh's Award Scheme —a challenge to the young people of Australia to show what they are made of. It is not a competition against others, the challenge is a personal one for each boy or girl (between 14 and 19) to reach standards laid down in one activity from each of four groups, e.g. for boys, Rescue and Public Service, Expeditions, Pursuits and Projects, and Fitness. It is likely that our Y.R.S. certificates will be acceptable—some discussion has been started. Club leaders can get full information from their State Supervisors on this part, but the general conditions for other sections are laid down by the National Fitness Council. Club leaders who have members with wide interests and sufficient of what it takes to tackle all four sections should have a drive on this one. Who will be the first Y.R.S. member to be presented with the Duke of Edinburgh's medal by the Duke or the Governor-General?

Some items from VK2: Some details are now available about the latest schoolboy A.O.C.P., Paul Goldsbrough, of St. Edward's College, Gosford. Lee Kinsella, who started Paul on his Amateur Radio, writes that Paul passed full certificate but has to wait till next year to turn 16 before getting his licence. He did c.w. mainly with the VK2 Slow Morse session. but also had tapes from the Slow Morse stalwart organiser, Frank 2ACQ. Lee (2AXK), of Christian Brothers' College, Wollongong, at present has a booklet Y.R.S.I. (Administrative Details) which he is stencilling for club leaders, so you should send Lee a half-foolscap envelope (stamped with 8d.), print Y.R.S.I. in bottom left corner and include one 5d. stamp to help with expenses.

A nice budget of news from 4 Uncle Charlie. There are now 15 registered clubs. 4PE at Padua Coillege went on the air on 19th Sept. with Rupert 4ID in charge and local dignatories and club member Bob Stroud (operating) making contact with 4WI, 4PJ, (VK4 President), 4RP (Clontarf High), 4DS (De La Salle College), 2AIH (Inverell High) and Lee 2AXK at Wollongong. New clubs at Redcliffe High (run by teacher Ken Keith), Yeronga High (70 members and 3 teachers). Ipswich Amateur Radio Club has formed a strong and active Youth Section which meets on Friday nights at the QTH of Warren 4GT (the leader), has 22 members (10 to 16 years) with projects ranging from xtal set to 4-tube superhet. Office-bearers are Malcolm Rouse (Pres.), Peter Twining (Sec.), John Beattie (Treas.). Publicity in the Ipswich Press brought in 40 old radios. They aim to have a station licence next year.

Clontarf High is on the air three afternoons a week looking for contacts from 3.15 to 4. Claude 4UX is to address the October meeting of the Science Teachers' Association of Qld. on Y.R.S. organisation, display some gear, and operate a station. There is to be an article in above Association's newsletter and in the Qld. Teachers' Journal. Proserpine and Gladstone Scout Groups are very keen but stranded —no Amateurs in the area, not even somebody mildly interested in Radio, to help them!

News from VK3 is interesting and widespread. Blind Amateur Cyril 3AUM and Ron Everett, of A.P.I., are assisting with Royal Vic. Institute for the Blind at Burwood. Some of the standard radio symbols are being built out of wire on tinplate, and Cyril is arranging the Braille lettering. Robin Rowlands, of Scotch College, gives the news that Peter Garde should be on 6 mx by Sept. Rodney Tucker is already active on 2 mx and hopes to sit for the c.w. in October. Club at Korumburra reports members building wide range of projects including 2 and 6 mx rx, c.r.o., amplifiers, etc. New club at Strathmore High with instructor Mr. P. K. Alsop. Wilf Miles bearing the load at the Australian Postal Institute. Dave Buck and this club are great supporters of the Y.R.S. Boys at Bundoora received their first QSL from Division President of VK5, who also wrote a letter of encouragement.

Sunday, 13th Sept., was open day at the Christian Bros. Edmund Rice College, Bundoora. Harry 3EK installed a portable tx as part of the Y.R.C. display to demonstrate Amateur Radio in action to club members. The tx was loaded into a long wire antenna on 80 mx and the following VK stations were contacted: 3TL, 3AVK, 3DF, 3EO, 3VL and 3MO. Each of the boys had a turn at the mike and were impressed by the way a net was quickly formed out of one contact. Featured as part of the Y.R.C. display were the elementary certificates the boys had received recently, also equipment, books and tools, etc., owned by the club. The crystal sets and one-valve rx's built by the boys are part of the practical tests were also working. The display was a credit to the club who were able to fill a class room with items that created interest amongst the parents and other boys of the school. (Thanks for this info, Dave 3ZMX.)

I had a chat to Bob 5OD on the air recently and was glad to hear things are moving generally in VK5. I know time is needed to get things going so will be looking forward to the next few months in VK5, especially after the schools resume in February.

Would like to talk to more Y.R.S. stalwarts. I'm often operating VK1ACA (Canberra Radio Society) on 80 mx, Friday night about 8.30. If anybody cares to give me a call, will appreciate it. 73, Ken 1KM.

This badge distinguishes the active member of the W.I.A. You can purchase it from your Divisional Secretary.

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

TIT-BITS FROM TIM

In QSLing to a broadcast station even the scantiest information, like, "I heard your station, please send me a card," will nearly always receive a speedy return of anything from a card to all the printed matter under the sun. B.c. S.w.l'ing is easy as stations want your name to boost their known listening audiences.

The same is not the case when replying to an Amateur. A report like "I heard you working my neighbour last night, please send me a card" will not get very far. Your details must be good. They must be of some use to that Amateur. If the average S.w.l. has a return better than 5% of the number sent out, he is lucky. Cards cost money, so be on the ball with every relavent detail and your returns may improve.

I was sorry to hear that the VK7 group had disbanded through lack of support. If there are not enough members to keep the group going for meetings, how about someone keeping the issue of S.w.l. numbers alive?

Well yet another year is drawing to a close. Don't forget the Ross Hull V.h.f. Contest next month, a bit long, but worth supporting. Ross Hull was an Australian but spent much of his later life in America. A tireless worker with the A.R.R.L., "QST" and the Handbook and many activities both in and out of Amateur Radio. He met his untimely death by being electrocuted from the high voltage supply of a t.v. set on the night of 13th Sept., 1938.—Tim, L2052/2ZTM.

FREQUENCY AND WAVELENGTH
(Continued)

How engineers define the word frequency is by the number of complete waves or cycles of the particular signal which would pass a given point in one second, hence the term cycles per second.

But why talk about cycles-per-second when there are more convenient terms available? Remembering that 1,000 cycles is equal to 1 kilocycle, we can express the frequency of the wavelength quoted as 1,000 kc. per second or simply 1,000 kc. To take the abbreviation one step further, it can be expressed as 1 megacycle per second, or 1 Mc.

From all this we can derive a simple formula. To convert wavelength in metres to frequency in kilocycles, simply divide into a figure of 300,000. The formula works both ways, so that if you divide frequency into kc., into 300,000, the answer is wavelength in metres. Finally, one megacycle is equal to 1,000 kc., and that is equal in turn to 1,000,000 cycles.

For convenience of reference, the radio frequency spectrum is divided into bands. Of interest to the average experimenter are the medium and high frequency bands. These bands cover from 300 to 3,000 kc., and from 3,000 kc. to 30 Mc. respectively. The familiar broadcast band lies within the first mentioned and is from 500 kc. to 1,500 kc. The short wave band is really the high frequency band, the major International short wave stations collecting at various spots.

NEW SOUTH WALES

If the steady increase of members to our meetings continues, then our committee will be rewarded for their effort to revive interest over the past twelve months. It is certainly gratifying for the chaps who come along each month to see the new faces appearing, and we trust that they will continue to do so.

Ross L2290/2ZKB is busy excavating for the erection of his tower, which by now should be on the way up. Sorry that you missed the R.D. Contest, but holidays are important as well. OK on your new countries.

Ray L2287 sends word of having logged FB8, VR1, JA, KS6, KM6, KW6, YU, CR7, FU8, UA1, UW, and 9M2 with QSLs from YN1AH and VK0JQ. Nice going Ray.

Don L2022 was in Sydney during September, but owing to a mishap could not get along to our meeting. Sorry to have missed the chance to have met you OM.

Ray Bergmeir: I trust that my reply was to your satisfaction and the pamphlets were of some value. If I can be of help at any time just drop a letter to me.

Sid L2258 has had rx trouble, but is once again back in business. Many thanks for your continued assistance re this page, it has been much appreciated.

Mac L2/3074 has words with me once a week over the blower, and I would say that he is gradually getting back on the air. He sends his regards to all his mates down south.

VICTORIA

Eric L3042 is in direct contact with CO2BB (Cuba) by mail and can pass any S.w.l. reports to him at any time. He is sending all QSL cards for VK direct to him for distribution. A rare QSL received in the form of one from W6EYH/Mobile 9 because it is for a transmission using c.w., when on a vacation trip in his car. When Eric heard him he was near Chicago on his way home. Other QSLs to hand: CO2, FO8, KM6, KP4, KV4, MP4, UD6, UF6, UL7, UR2, VQ1, YN1, 4U1, etc. Plenty more, but have space trouble, sorry Eric.

Lloyd L3141: Sorry to hear that the wind played such havoc with your antenna, and also of your QRM problems. Thanks for the copy of the Long Island DX Bulletin, very good indeed. I shall return it at a later date.

From the Black Rock boy, Greg L3138, comes the usual compact letter which contains plenty of activity, plus the result of the V.F.L. final, hi. It's a pity they don't play the N.S.W. game down there. (Them's fighting words!—Editor.) Latest QSLs received: OZ9, UA0, UA9, ZS4, FO8, G3, VS1, MP4, YV5, etc., whilst heard covers quite a nice variety.

Drew Diamond, another keen lad who uses a home brew rx with a half wave dipole, up some 20 ft. That was a very impressive list of DX received. I was very pleased to hear from you.

Addison L3071 is a s.w.b.c. listener and sent quite a long list of stations received on those bands.

QUEENSLAND

From the Brisbane boatman, Lew L4020, comes a photo of one of his catches of some really big fish. Quite a handsome trio—the two fish and the angler, hi. Recent logs: JA, KW6, XE, W6s and Ks.

Charlie L4018 has sent me particulars of the Certificate Hunters' Club which I will include in the article on awards in the near future. Congrats on being the first S.w.l. Oceania member of the above club, and thanks for your nice remarks.

Thanks to A. Robson, of Rockhampton, and K. Reis, of Toowoomba, for their letters. I hope the printed matter was of interest.

SOUTH AUSTRALIA

Last month I was pleased to add another name to the L5 list. This month it is my pleasure to add yet one more, and trust as time goes by to add many more. A welcome to the page goes to Tim Corbin, L5067, who is hoping to gain a rung on the DX Ladder very soon. His first DX: KL7, HC1, ZE7, VR and Ws. Not a bad start OM.

Alan L5065: Congrats on gaining the L5 section of the N.F.D. Contest. I hope that good tally in the R.D. brings you another first. OK on getting ready for the v.h.f. season. I think you will like those bands.

Brenton L5069: I must apologise, as I have mislaid your letter and naturally cannot make any comments.

WESTERN AUSTRALIA

From the lone L6, Peter L6021, comes the usual interesting letter. This month Peter received 130 cards, in which were 14 new countries. This puts him in second place on the Ladder. Also to hand is the R.S.G.B. 21-28 Mc. award which he won in 1963, nice going OM.

Congratulations to L2242, L3138 and L5049 for their respective wins in the Ross Hull V.h.f. Contest, 1963-64.

That's it for this month, chaps. Cheers, thanks to Tim and the members who have helped to make this page possible. 73, L2211.

S.W.L. DX LADDER

	Countries Conf.	Countries Hrd.	Zones Conf.	W States
E. Trebilcock	284	293	40	50
P. Drew	136	241	34	30
D. Grantley	124	281	38	35
A. Westcott	93	159	31	11
M. Hilliard	90	241	33	14
M. Cox	84	232	30	21
G. Earl	69	150	31	7
C. Aberneathy ..	63	104	33	14
N. Harrison	56	172	31	37
L. James	51	144	24	10
I. Thomas	42	139	20	14
R. Beckley	27	50	19	—
A. Raftery	21	126	15	3
R. Oats	9	26	8	—

Publications Committee Reports . . .

The Publications Committee reports that all inwards Divisional notes, etc., received at P.O. Box 36, up to the evening of the 12th October have been published in this issue of "A.R."

In addition correspondence was received from VKs 9PL, 4NS, 3LK and 2YB, and Technical Articles came from VKs 1AU, 6DR, 5JT and 3ZEL.

A matter from VK2AVA was referred to the Victorian Division Council for decision regarding policy.

The Committee discussed the publication of a "History of Communication" from J. R. Cox and agreed it should appear in serial form in "A.R." as soon as possible. Proofs for the "Call Book" have been returned to the P.M.G. for authorisation to publish and it is anticipated that the new edition should be available late in November. As already explained, the late publication date was due to negotiations with the P.M.G. and next year the "Call Book" will be issued in June-July.

Mr. Bill Roper was welcomed to the Committee and will act as technical article reader and v.h.f. adviser.

The question of publishing the Christmas issues of "A.R." was discussed and the view of the holiday period shut-down at the printers the following will be publication and issue dates:—

DECEMBER 1964: Copy required by 8th November for release on the 1st December.

JANUARY 1965: Copy required by 1st December for release late December or early January 1965.

FEBRUARY 1965: Due to the fact that this issue will be set up during December 1964 for issue in mid February 1965, it will not be possible to publish any Divisional Notes, SWL, VHF, DX Notes, etc., nor any Hamads. This will apply ONLY to this issue. Accordingly, the February issue will be devoted to technical articles.

All readers are particularly requested to note the above changes in the issue of "A.R." for 1965.

Finance of "A.R." was discussed and it was agreed to maintain the current budget which may show a slight deficit for the year.

No "A.R." wrappers were returned from the October issue, hence the Committee can only conclude that all wrappers are correctly addressed. Members of the W.I.A. should notify their Divisional Secretary of any change of address. Direct subscribers should write to the Admin. Secretary, W.I.A., C/o. P.O. Box 36, East Melbourne, C.2. All licensed Amateurs must notify the P.M.G. of any change of the address of their transmitting station, in addition "A.R." should also be advised.

Correspondents are again advised that ALL matters pertaining to "A.R." should be addressed only to P.O. Box 36, East Melbourne, C.2, Vic.

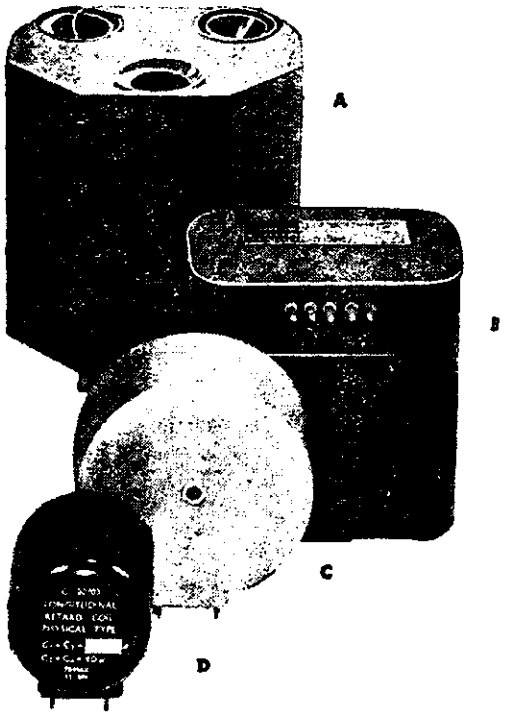
SUNSPOT ACTIVITY
(or lack of it)

We should all know that a "Zurich Sunspot Number" is an indication of the level of solar activity. We should also know that at present sunspot numbers are near rock-bottom, so as to speak—and because of such a situation, the ionospheric layers are far from dense, and m.u.f. for world-wide radio contacts are relatively low.

How many of you readers are aware that the Zurich Sunspot mean number (daily) for August 1958 was 200; for August 1961, 52; and for August 1964, 8? (Analyse it for yourself, try and recollect the 1958 feeling, or you newcomers imagine what it must have felt like in 1958!!)

The "experts" are now forecasting that December 1964 could well be the current sunspot minima month—after that there will be a slow climb back towards (we hope) the 1958 maximum level (and the good old DX days).

—Eric Trebilcock (WIA-L3042)



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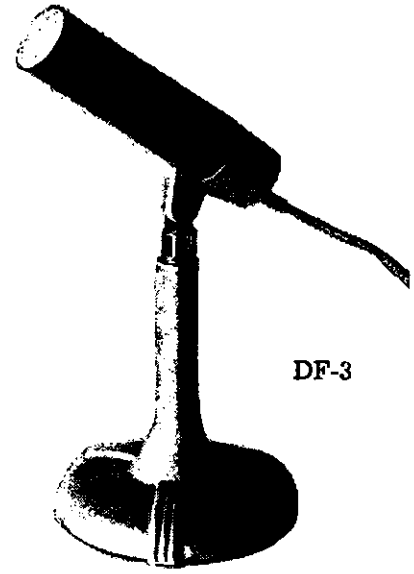
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FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.A.R.U. NEWS

Region II. Division

From 14th to 18th April, 1964, representatives from 16 I.A.R.U. Societies in Region II. met in Mexico City to form a Region II. Division of the I.A.R.U. A constitution patterned on that of Region I. was drawn up and an executive committee of six were appointed. Those appointed were:—

Chairman: Antonio Pita, XE1CCP.
Vice-Chairman: Italo Glammattei, YS1IM.
Secretary: Gustavo Teusens, OA4AV.
Treasurer: Noel Eaton, VE3CJ.
Member: Miguel Czysch, LU3DCA.
Member: Robert Denniston, W0NWX.

The new division looks forward to receiving further membership from countries not represented at the inaugural meeting.

U.S.A. Reciprocal Operating Privileges

On 28th May, 1964, President Johnson signed a bill on reciprocal operating for Amateurs to eventually make it possible for foreign Amateurs to apply for operating privileges in the U.S. When permission is granted, the foreign Amateur will be able to use his own call sign with an appropriate portable suffix. The A.R.R.L. hopes that Societies interested in this participation will approach their administrations to obtain this agreement with the U.S. State Department.

U.K. Licence Structure

The R.S.G.B. has announced that as from 1st June, 1964, a revised licence structure has been instituted. Existing licences will be replaced over the next year. The new structure includes the Amateur A, Amateur B, Amateur Mobile, and Amateur T.V. licences. Amateur A is the general licence, and Amateur B is a phone only licence restricted to operation above 420 Mc. with call letters beginning with G8 and three letter suffix. Amateur T.V. licences will be assigned G6 three letter calls followed by /T. Stations operating from a temporary location will now be able to use the prefix of the G country they are in followed by the call letters and /P. Log times are to be kept in G.M.T., while the frequency used, rather than the Amateur band, will also be required. As from this date, the 70 Mc. band will be extended to 70.1-70.7 Mc.

Newly Developing Countries

The following is in part the text of a letter from an official of one of the newer countries. This official is also a licensed Amateur:

"American Amateurs do indeed have a large responsibility for the future of Amateur Radio by virtue of their numbers and by the standards they set. In the developing countries, however, it is relatively easier for the local Amateur to maintain contact with the licensing authorities and to enhance (or damage) our image with them. A very great responsibility must therefore rest with those few Amateurs in DX locations. Most countries would like the world to know more about them; hence the desire for short-wave broadcasting. Our job is to convince the right people that 100 Amateurs at 100 watts each are worth more than one 10kw. broadcast station! The way I see it, we need more publicity directed towards telecommunications authorities in the newer countries. Could we not emulate the practice of commercial companies by sending complimentary copies of 'QST' to many administrations?"

The above includes many words of wisdom with which we heartily concur.

Retirement of G6CL

After 32 years as secretary-general of the R.S.G.B., John Clarricoats (G6CL), retired last December 31. Clarry was one of the leading lights in the founding of the Region I. Division of the I.A.R.U. and has consented to continue as secretary of its Executive Committee. We in the W.I.A. add our felicitations to those of the I.A.R.U. in wishing him a happy retirement and satisfaction that his vast experience is not to be lost to world-wide Radio Amateur affairs.

Commemorative Stamp

The A.R.R.L. in celebrating its 50th anniversary this year is fortunate in highlighting the occasion by the approval of the U.S. Department for a request for the issue of a postage stamp honoring Radio Amateurs. For those philatelists who are interested, October was the month for issue.

New Union Members

The W.I.A. takes pleasure in welcoming the Jamaica Amateur Radio Association (J.A.R.A.), the Radio Amateur Association of Greece (R.A.A.G.), and the Radio Society of Ceylon (R.S.C.) as new members of the I.A.R.U. Calendar 68 also announces proposals for the Amateur Radio Society of Barbados (A.R.S.B.) and the China Radio Association (C.R.A.) to become members. The W.I.A. has voted in favour of the A.R.S.B., but nay in the case of the C.R.A., as in this case all of the qualifications for membership have not been met, the main point being that of 1,500 members of the C.R.A. only one is a licensed Amateur. It should also be noted that the old Association des Amateurs-Emetteurs du Maroc (A.A.E.M.) has changed its name to the Association Royale des Amateurs Emetteurs du Maroc (A.R.A.E.M.).

Amateur Band Intruders

In most I.A.R.U. Calendars are listed intruding stations into Amateur bands, as logged on a number of occasions by the International Frequency Registration Board of the I.T.U. which has 93 different monitoring stations located throughout the various sovereign nations. In the last Calendar a number of Russian stations were listed, but particularly two on 7060 and 7035 kc. The secretary of the Radio Sports Federation (R.S.F.), the Russian I.A.R.U. Society, has informed the hqdrs. that his government denies operation of any stations in the Amateur bands. We offer no comment on the above statement, but invite members who have the time to report any infringements of this nature through their Divisions. Forms should be available for reporting from your Division.

FEDERAL EXECUTIVE, 1964-65

The following Federal Executive Officers were appointed by Federal Council and notified on 31st July, 1964:—

Major Bill Mitchell, VK3UM, Fed. President.
Maxwell G. Hull, VK3ZS, Fed. Vice-Pres.
Jay Lancaster, VK3JL, Fed. Secretary.
Robert Boase, VK3NI, Fed. Treasurer.
David Rankin, VK3QV, Fed. Activ. Mngr.
Alf Seedsman, VK3IE, Fed. Business Mngr.
Arthur Tinkler, VK3ZV, Fed. Com. Mngr.

The following co-opted officers of Federal Executive have been appointed for the tasks shown:—

Ray Jones, VK3RJ, QSL Officer.
Alf Kissick, VK3KB, Awards Officer.
Tom Straughair, VK3ABV, Project Officer.
George Glover, VK3AG, Historical Officer.
Lionel Sharp, VK4NS, Contest Officer.
Rex Black, VK2YA, Youth Radio Club Offic.

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NEW SOUTH WALES

HUNTER BRANCH

And so the Hunter Branch Convention is past. What a successful Convention this was. For the first time in many years, the customary "all male" dinner took a new face—indeed a new dignity—when we were favoured with the pleasant company of the ladies. And from all reports the ladies enjoyed it too. So why not make this a regular feature of our annual event? It certainly was the formula for success this year. All told, there were 80 members and guests at this most pleasant evening and, following the more formal speeches delivered by Lionel 2CS, Pierce 2APQ and Keith 2AKX, another Keith, 2ZAU this time, of the staff of Radio and Hobbies, gave us an interesting insight into the future. Keith called this his "Crystal Ball Night" and he chose to describe three pieces of equipment which will be featured soon in the magazine. Stuart 2AYF proposed a vote of thanks to Keith at the conclusion of the evening. Meanwhile, Frank 2APO kept things rolling at the top table. I have not quite forgiven him yet, and those who were there will know what all that is about.

To begin at the beginning is always a wise move and so I should report first the activities of the constructional competition. This was the best patronised competition we have ever had. The following were the constructors, in order of appearance: Les 2RJ, a two metre sniffer; Mac 2ZMO, a two mx tx for the table top; Des 2ZDN, two transceivers using transistors; Ian O'Toole, a low frequency rx; Bill 2ZWM, a 6 mx tx; Bill 2ZCV, a 2 mx transceiver, and Bob 2ASZ (visitor from Sydney), an s.s.b. transceiver. As can be imagined, deciding the eventual winner was a difficult task indeed with such an array of first class gear. So difficult, that members were asked to vote on the item of their choice so as to assist the committee. Des 2ZDN was pronounced the winner at the prize giving ceremony the next day and his trophy, a c.r.t. donated by Philips, was a fitting prize for such a good effort.

At first the day looked like being a real beam reducer with winds of 40 m.p.h. or so on the morning of the Field Day, but things calmed down and the final judgment was "a good time was had".

The scramble was won by Dave 2AWZ with the ether crusher while the early 2 mx hunt, only other event of the morning, was a victory for Harold 2AHA. In the afternoon, things really did an about face when the Susan 2BSB-Allen Legge-Ray Elkin team, using a transistor portable, came in first in the 7 meg. hunt. To say that the rig was carefully and cunningly concealed would be boasting I suppose, but it sure was wet in the water! I am led to believe that Susan's car is available for scrap at the call book address. Oh those wicked foxes. They choose the nastiest roads. In the afternoon 2 mx hunt, known as the Strongarm 500, first in was Harold 2AAH in 14 minutes! Remarks as to vehicle availability as above.

For those wishing to remain on the ground, there were two quizzers. The both were taken off by the Mullen household, Tony winning the technical section in a play off with Max 2MP, with Marcia being the best in the ladies' section. And to cap it all, Tony also had been presented with the V.h.f. R.D. prize the night before! Watch him lads! Best performance of the day went to Harold 2AAH and even the lady visitors were well catered for, Mrs. Pierce 2APQ being the holder of the lucky number. As for the lucky gent, it was, or is at the present, me, for I have the prize of two 807s for the holder of ticket F52. Please come and claim them—they are so tempting.

In addition to all the festivities there were some items of gear to be seen and heard as well. Arie 2AVA had some very compact equipment for the ducktalkers. A top band link was established between the hall and the Westlakes Club and some clown in a beaten

CLOSING DATES FOR COPY

DECEMBER 1964 ISSUE:
8th NOVEMBER, 1964

JANUARY 1965 ISSUE:
1st DECEMBER, 1964

FEBRUARY 1965 ISSUE:
NO NOTES, etc. See Page 15 (Publications Committee Reports)

up Fiat supported under a monstrous whip did some mobile working on this band. You won't believe it, but Frank says it'll be even better next year.

Thanks to all who helped, especially Kevin, Norm, Chris, Bill, Varley and any others I've missed—you're the chaps who made it what it was.

It seems that that little bit has taken up all the space that Hon. Editor will allow, so it remains only for me to say that you must not miss the next meeting. November 6 is the date, and the place is room 8 in the classroom block at the Tighes Hill Tech. We are to be treated to an unusual and most revealing lecture on Microminiaturisation, to be given by Col. H. J. Trick, head of the Military Products Division of A.W.A. He is bringing some new equipment to show the boys and this will be the first showing to the public in Australia we are told. So don't miss it, whatever you do. We start at 8 p.m.

I'm a bit unhappy really. All these lucky chaps on holidays, Bill 2XT in Japan, Lionel 2CS here, there and everywhere, and—no I promised I wouldn't say the other one. Still I suppose there are compensations, I'll not miss the meeting. By the way, did you know that our Arie has a new name—you ask him. And that two of our members are waiting for a long letter in the affirmative from the examinations branch. Best of luck chaps. 73, 2AKX.

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VICTORIA

WESTERN ZONE

Quite a nice gathering took place in Nhill on Sunday, 27th September, when we held our Annual Convention. About 30 members and their families braved the rather wintry conditions. We were sorry that because of bad flying weather the flying group of the South Western Zone were unable to be with us. However will order a day to suit next year, Don, XYL and party.

Officers elected for following year were: President, J. W. Edmonds, 3AFU; Vice-Presidents, W. A. D. Giles, 3ADS; W. K. Semmler, 3ATS; Sec. and Treas., W. J. Kinsella, 3AKW, re-elected. A special committee was formed to organise W.I.C.E.N. activities. They are 3AFU (Clear Lake), 3AKW (Lubeck), 3ADS (Glenorchy), 3AOS (Telangatuk), 3ATN (Birchip).

The s.s.b. chappies seem to be the most active DXers. Harry 3ZX is now testing out a super quad with encouraging results. Ex-local, Chas. VR1B, at present in the Gilbert Islands, is heard quite often on the DX bands and I believe will be back this way towards the end of next year. Merv. 3AFO and family have just returned after their holidays which they spent touring Mildura and Canberra areas. 73, 3AKW.

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QUEENSLAND

Last month things were very quiet on the home front news wise. Therefore I think it is about time that I declare this advertisement month. If you are intrigued, then the following is aimed at those who are unable to make the Sunday morning news broadcast from 4WI.

With all the talk of Queensland's progress, it is necessary that this Division progresses also. The VK4 Division does not intend to stand still however. With this in mind, we solicit all interested persons to join our ranks. If someone comes to your QTH inquiring about Amateur Radio, then invite him to become a member of the W.I.A.

You may wonder why news of your particular district does not come over 4WI and maybe you think we are biased about your locality. This is not so. The only reason why we do not put your district's news on the air is that no one in your area can be bothered to send any news to us for broadcast. We welcome news, both personal and general, about the doings of Amateurs, Clubs, etc., from all parts of the State.

Therefore all clubs take note! Get your public relations officer to send us the news from your club. In fact, anyone is welcome to put any news on paper and send it to Box 638J, G.P.O., Brisbane. It will be broadcast.

It was inadvertently stated in the September edition of "A.R." that the call sign 4WQ belongs to the Bundaberg Amateur Radio Club. I am sorry if the statement misled anyone. The sentence should have read that 4WQ is the official call sign of the Wireless Institute of Australia, "Wide Bay and Burnett Branch" and that the station is situated at the club rooms of the Bundaberg Amateur Radio Club. I hope things are correct now. Anyway, has the station been heard yet? Notes from Wide Bay give it no mention this month.

Now for a pat on the back! During the last six months, something like fifty thousand words of news have been broadcast over 4WI. Fairly obviously, Queensland Amateurs have been active, but there is always the feeling of some that the bands could be used even more.

Well I hope you didn't mind those direct broadsides, but they have to be said every now and then if this Division is to keep to its policy of progress.

YOUTH RADIO CLUBS

Discussions with a number of science teachers during a vacation school at the University of Queensland allowed a lot of publicity to be given to the Youth Radio Scheme. It seems that the Pomona Rural School, under the guidance of Garth Baker, will form a club. Harry Mitcham, of the Mount Isa High, is keen and Ken Keith from Redcliffe High is at long last getting into the picture. Other possibilities that we have heard of include Yeronga State High, Gympie Christian Brothers, and a G.P.S. School, Gregory Terrace.

Cairns High is going along very quietly and it is being said that they are going to come on with a few hundred watts of s.s.b.—what say you Alex? Big news of the month is 4PE, Padua College. They made their first contact with 4WI during last month and then they worked the other two licensed youth radio clubs, 4RP and 4DS. At the time of writing, a Y.R.S. morse contest was in view. Club champions from the schools will probably compete against one another to find the VK4 champion. Both under 15 and over 15 divisions will be contested.

Specimen papers for junior certificates are in the process of duplication and Harry 4ZHG should have puzzled the lads in Gympie with them by now. A completely new set of conditions for the elementary and other awards has also arrived. Before leaving this subject, we wish to state in print that the VK4 Division is very lucky indeed to have a youth radio organiser such as Charlie 4UC. He has applied hinmself wholeheartedly to the job of interesting schools in the scheme and the results he has achieved in such a short time are truly astounding. Keep up the good work Charlie. It is hoped that by this time next year, your list of clubs will have increased fourfold at least.

Perhaps if our hopes are realised we will no longer be discussing the s.w.r. of the feeder but rather the covalent or colonic bonding mechanism exhibited by ammonium bi-fluoride.

GENERAL NEWS

Recently Alf 4OL, who is the voice behind 4WI, took his annual holidays. The transmissions on Sunday mornings were made from a number of stations during the time Alf was away. We wish to thank these stations for making themselves available and we hope that the news was heard at your QTH at its usual strength. Alf has taken on a new job and this should allow him to be around at night for a change. He will probably be able to attend the monthly meetings since he will now be working during the daylight hours and not at night as previously.

Technical difficulties were experienced with the production of "QTC" for September. This is another way of saying that the typewriter for the cutting of the stencils refused to operate satisfactorily. As the production of "QTC" is a voluntary effort, some delay was inevitable.

The September general meeting was not well attended due to the fact that "QTC' had not been published. Even the lecturer for the evening did not arrive. Impromptu lecturers were drawn from the body of the meeting. Paul Rodukoff talked about his experiments with Q multipliers and then Jim 4PR gave an interesting discussion on transformerless power supplies. Paul again arose and warned of the hazards of using such a design. Claude 4UX was present at the meeting and gave details of activity of the northern boys. 73, 4ZBD.

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SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division for September was held as usual in the club rooms to a well-below average gathering of members and visitors, with the lecturer for the night being Rob 5RG and the subject, "Spurious Radiations". Rob had been called upon at very short notice to fill in for the night, but came along armed with copious notes on the subject plus a wealth of practical knowledge gained in the field and at various locations and call signs. Fortunately for me, he started off almost immediately with chalk and blackboard, naturally letting me out of any further cover of the lecture, for which I thank him sincerely. All that I can say is that judging by the rapt attention of those present, and the nature of the questions asked at the end of his talk, he achieved his object, that of giving us all something to think about, and also perhaps to make it possible for Amateurs to live with nearby fellow Amateurs in peace and contentment and thus open up larger segments of the bands for operation by these same nearby Amateurs.

The vote of thanks to the lecturer was ably, and somewhat humorously, given by Gilbert 5GX, and the applause was again sufficient indication of the good job performed by Rob.

For some strange reason, known only to the powers that be, the meeting was closed at the conclusion of smoke-oh without any of the usual business side of the meeting being held, either Federal or General, despite the vocal objections of grumpy old Parsons 5PS, who was amiably disposed of by the President (Phil 5NN), apparently to the secret enjoyment and satisfaction of all present. Anyway, I should care, at least I got it into the minutes, I think.

Noticed the Rev. White, from the Central Methodist Mission, present at the meeting as a visitor. Also noted that he was enrolled as an associate member later on. I checked up with him during smoke-oh as to his reasons for joining so late in life. He told me that he is now somewhat semi-retired and has taken up the threads of short wave listening, a hobby that he has always wished to participate in but up till now has never had the time to fully enjoy. He is to be congratulated on his decision, and who knows, one day in the future he might have his own call sign although when I suggested this to him he modestly thought not.

Understand that Joe 5JT is playing around with reduced size antennae, with particular emphasis on 7 Mc. He is still getting around on a stick, but is as lively as a cricket, although the first to admit that he never should have climbed up that beam at his age. Nice to hear about you Joe.

Also heard that Pat 5KM, from Victor Harbour, is interested in the Swiss Quad, the

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

nature of which I am in complete ignorance. Swiss cheese by all means, but Swiss Quads, well I ask you?

Gilbert 5GX brazenly admitted at the meeting that he had recently attended a lecture at the Police Barracks, due, as he cheekily put it, to a misunderstanding with the Police radar. Take yourself in hand Gilbert, what with eating double ice creams in the main street of Kingscote and now in the clutches of the coppers, you are becoming a little devil!

Latest reports from the southern suburbs tell of Leith 5LG running amuck with a lawn mower in the back garden the other day and cutting up his beam control cable. Heard him telling Uncle Tom (5TL) of the incident on the air and also hoping that Pansy would not be listening in. Well I was, see, and I did not have any cotton wool in my ears like all of your neighbours did, ten seconds after the beam cable finished in the grass catcher. Tut-tut!!

George 5GG, Garry 5ZK and Gilbert 5GX heard cutting themselves a piece of the DX that bobbed up on twenty recently. Gilbert got 20 over 9 from Liverpool in one contact, but I think it was unnecessary of him to point out to me, with an obvious leer, that all three were on s.s.b. Pooh to you!!

With all this talk of DX on 20 mx around, I was somewhat taken aback to hear George 5RX say that he had not been doing much on the air as he had been gardening of late. DX around and George gardening. This I have to see!

In my long association with Amateur Radio as a hobby I have had a number of disappointments, such as, when they took my coherer away from me, when they made me give up loop phone, when they made me put filters in my power supply, to name a few. These little upsets of course I managed to take in my stride, but last month fate dealt me a blow below the belt, or should I say below where my belt should have been, to wit the discovery that in VK5 we are sheltering a renegade, yes sir, a deserter to the cause. I could hardly believe my eyes. There it was in black and white, the Western Zone sub-editor, none other than Barry 5YB, and to cap it all, having a shot at me to boot. To think this could happen to me, a VK5 writing for the VK3s, and from all appearances enjoying it too! Just goes to show to what lengths they will go to upend me. Oh woe is me!!!

Talking of other Divisional sub-editors, and who in the world would want to talk of other sub-editors? I notice upon reading the VK4 general news, that there is an "anonymous me" who just puts the news into some readable form and Bill 4ZBD just signs his name. Well, how would you be? Don't some people get it easy, no wonder they can't grow a straight banana up there!

Received a welcome letter from my espionage agent in the South East, unfortunately a little late for last month's notes, but still welcome news all the same. In it he tells me that the most notable achievement of recent date is that they had a 100 per cent. participation from the full licence members in Mt. Gambier for the R.D. Contest. Leo 5GJ and John 5JA blew the dust off their gear and worked 10 stations each, and Claude 5CH, Erg 5KU, Stuart 5MS and Col 5CJ also participated to help increase the score for VK5. There was also an entry in the v.h.f. side of the game, Col 5ZKR managed to work five stations on 52 Megs and above, and finished up with 55 points for the five contacts. My spy thinks that this is probably the first time that this has happened. Any doubters? He also tells me that the 80 mx broadcasts from 5WI continue to be 5/9 in Mount Gambier.

Arriving home from toil the other Saturday evening, I had just turned the corner when I noticed, with some trepidation, a somewhat familiar motor car with a Victorian number plate. Now the sight of a Victorian number plate at any time is enough to give me an attack of the trembles, but this car seemed too familiar for even an attack of the trembles to be enough to meet the situation. Sure enough, when I lifted the flap of the tent, who should be sitting on my best and most comfortable packing case, none other than the new Assistant Editor of "A.R.," that purveyor of malicious gossip concerning me in the magazine, that insulter—that—that—oh what's the use, it never gets me anywhere, none other than Ken 3AFJ. Working on the old Arabian proverb that it is better to kiss the hand that one cannot bite, I greeted him with some reserve, after turning down the hurricane lamp (it took me a week or so to remove the black smoke marks from the glass—what's wrong with these VK3s, don't they ever practise economy?), anyway, as I said, I greeted him with some reserve, and we finished up having quite a long talk on matters radio, whilst he spilt salt at our table. He was off next day to Port Augusta, and was to return to Adelaide on the Monday, and promised to spill some more salt at our table on that day. I have not heard or seen anything of him since that date and can only assume, and hope, that my smoke signals to the chief of the See Humpty Wah tribe, camped just outside of Port Augusta were received loud and clear and if so, then no longer will I have to bother about kissing hands that I cannot bite. Did he get back home Joan?

The Woomera Amateur Radio Club recently held its 10th annual general meeting to a very representative gathering of members, and the following officers were elected: President, J. Mount, 5EV; Secretary, D. Avard, 5OF; Treasurer, J. Pepper; Council members, Ian Hunt, 5QX; and T. Mitchell, 5TH. The QSL Manager is G. Albeck. Technical Officer is B. Wheeler, 5BV and last but by no means least, the Publicity Officer is T. Mitchell, 5TH.

It goes without saying that due to the floating population aspect of Woomera, the turnover of members is fairly high, but the average membership is around the 20 mark. They have a get-together on most Friday evenings at the club rooms at which experience (and enjoyment) is gained by the non-licensed members in the art of radio operating, plus plenty of discussion centred on the techniques of Amateur Radio, etc.

The club has appointed the licensed members to a roster system for the monitoring of the Sunday morning broadcasts of 5WI, and also for call-backs when 5WC will be kept on the air until lunch time, and naturally contacts will be appreciated from all directions of the compass.

It will be seen from this brief report that Friday and Sunday constitute the bulk of the club activities on the air, and the licensed members will choose other times for their serious DX activity. Keep your ears open for 5WC and give the boys the chance of a contact with the outside world, also the chance for the beginners to see just what makes Amateur Radio tick. Thanks for the notes Trevor 5TH, they are always welcome and who knows, you may well qualify for one of those mythical noughts that are reputed to be thrown about with reckless abandon by the Publications Committee.

Bumped into Norm Coltman the other day. After picking myself up, I could not but observe just how well he is looking. He has had a little gland trouble over the past year or so, which has somewhat slowed him down, but with a little dieting, plenty of attention from the XYL, to say nothing of a little slowing down in the activities in the direction of the North East, and all is now well. He still flatters me—his closing remarks as we parted were: "I was reading your notes in the magazine and I fell asleep before I could finish them!" Thank you for those kind words, Sir.

Joe 5JO called in the other day and left a letter for my perusal that he had received from Bob 5PU, who is at the moment in America, and from all appearances, thoroughly enjoying himself. At the moment of writing he and his family had just returned from a motoring trip to Toronto, Canada, but somewhat sadly reports that he did not see one Ham antenna, mainly due to there being so many t.v. antennae in the sky that he could not see the trees for the woods, or something like that! However, all was not lost, because he did see plenty of cars on the highways with halos and whips, complete with call signs for number plates, although none of them seemed to stop just where he did. He mentioned how sorry he was to hear of the passing of Luke 5LL, and also wishes to be remembered to all of the VK5 gang. No mention of when he is returning, but he is coming back via England and the Middle East. Thanks, Joe, letter much appreciated. 73, Bob.

Notice that the VK1 correspondent for the Youths Club radio activity now treats me with ignore since he has discovered Bob 5OD. Can't help but observe the different approach in his writings. Did he ever ask me for some news, and add "if we are friends?" No sir, all he ever did to me was to try and shoot me down in flames! How are you Ken? Are we still buddies?

Did you notice Mr. Wilson (4RW)—we are not on christian names standing yet—trying to put himself in for a "cuppa" with Muriel 2AIA in his notes last month? How cheeky can they get? If there are any "cuppa's" going from that bevy of beauty, Muriel 2AIA, Mona 2AXS, Hebe 2AOK and Verle 2MR, then let me assure all and sundry that my dainty hand will be holding the cup. Won't I girls? Shush-h-h-h, not too loud, they might hear you!

No news lately of that old VK5 veteran Rupe 7RM. Buck 5DA, to say nothing of enquiries from several other sources, was asking after you Rupe. What about a couple of lines some time?

It was good to hear at the meeting, in the new members' list, the names of several of the older ex-members who had decided to renew their subs. This is to the good, after several years' absence from the Divisional scene. Quite a number of old members who have let their subs. go for various reasons would probably join again with a little gentle nudging. Don't let that joining fee bother you. I would hate to hold out a sub. in the general direction of the Treasurer (Harry 5MY). Joining fees or any other such simple by-laws never worry him. His telephone number is 53-2121, and he is not too proud to sign you up.

About a year or so ago, any time that one listened on 7 Mc. during the early afternoons, the University Amateur Radio Club (5UA) and the Prince Alfred Amateur Radio Club (5PZ) seemed to be the only VK5 stations on the air consistently at that time. These days it would be a novelty if either station was heard on at all. Pity in a way, I suppose it is the old story, one or two of the enthusiastic ones move on and the driving force is gone.

Thought the photo of A1 5ZC on the September cover of the magazine was a good one, the fact that it was a VK5 might have biassed me a little. What's that? There is only one S in biased. Pardon me—in my dictionary it shows one S or two S'es, please yourself. Naturally living up to my name of a "padder", I prefer to use the extra letter! However, getting back to my subject, I had a look through some of my best photographs with the idea of sending one to the magazine in the hope of making the front cover. I picked a beauty—one of my best poses—unfortunately my XYL tells me that a picture of me laying on my tummy in an outsize in seashells, with my legs kicking in the air, would not have much appeal. A pity, I had such a ducky blue ribbon around my chubby neck too!!

This month has been a bad month for news of any description. The bands are extra quiet, my espionage agents have all but disappeared and my new working hours make listening almost impossible. However, just as I was going to put these notes to bed, along came "Info," the official journal of the Elizabeth Amateur Radio Club (5LZ) from which, without any compunction whatsoever, I pirate this last page of notes!

Bill 5WV is tinkering with the idea of giving s.s.b. a trial, and is at the moment of writing gathering the bits and pieces together in preparation. Clive 5PE, Bill 5VE and Ted 5ZE have been heard on 80 mx c.w. My shanghaied spy adds, "keeping their hands in, no doubt." Angus 5DE is busy rushing around the donga and is conspicuous by his absence. What is a donga? Do you mean to tell me that you don't know what a donga is? You don't know what a donga is? Well, well, well. How ignorant can one be. Do I know what a donga is? Haw-haw-haw! No I don't!!

John 1QL (ex-5QL) is now domiciled in Canberra and appears quite keen on the club activities over there. Watch out for that Ken 1KM. He thinks all VK5s are like me, John!

Ian 5IK is likely to move to VK3, so the rumour goes. My sympathy is extended to you OM, it is bad enough having them loitering on our border, let alone having to live with them. Keep away from Pincott 3AFJ, he bites!

Ron 5FY is still reported as having almost given the game away and this assertion is being made much too frequent for my peace of mind. What about a statement OM? I am so perturbed at the continuation of the news that I intend to write personally. Watch for an unstamped envelope!

Well, this is it, at last the end. But before I close, I must tell you of one of the safety slogans that my source of income received for a slogan contest they held recently. It was from a Boy Scout, of somewhat tender age. I quote: "Don't smoke in bed—the sleeping bag you burn may be your wife." Sit down my sweetness, not you! 73 de 5PS. PanSy to you.

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WESTERN AUSTRALIA

This month we have had one contest, the 80 mx scramble which was quite a success with several country stations taking part. It was a pity however that more did not take part as obviously many were just listening. The swap over to 80 in lieu of 40 was a move in the right direction with propagation being as it is.

Recently two of our members went over to Mount Macedon to attend the Communications Course and their reports were very good. It would appear, however, that the Establishment may not be very sound as one of them

swears that the walls and mirror were moving one night. This could have been caused by something else however.

Activity on the various bands is very patchy, but one can hear quite a number of signals on 80 most evenings. This will probably change however with the approach of summer and its problems for this band. Twenty metres has been coming to life in the evenings of late, with signals coming from Europe and India. American signals have also been coming in quite well.

Any country member who may have an item to be submitted for the agenda at next year's Federal Convention should submit it as early as possible so that it can be processed and ready early. This does not only apply to country members, but also to any members.

Once again this month information has been very scarce and I would very much appreciate anything of interest being passed on to me.

I believe that if anyone would like a demonstration of the cornering ability of a Freeway, they should try Geraldton for a likely place. However, would suggest that you use a different story than the one used by one of the members already.

Bernie 6KJ was travelling up to Perth and was using his Swan mobile and the signal on 80 was excellent. I believe many more Amateurs have or are building up mobile gear and we should hear more mobile signals in the future.

Your Council will be very pleased to receive any suggestions which you may put forward. If you have any complaints we would like to hear these also.

This seems to be all for now, chaps, so till next month, 73, Roy 6RY.

— • • • —

TASMANIA

It is strange how little information a scribe starts out with when writing for this column (this scribe, anyway), but, after a ten-minute QSO via 600 ohms with a certain person who seems to keep his ears open all the time, I think I've just about got enough to make a showing.

Quite a few well known call signs have been heard on the air of late, some of them after quite considerable periods of silence. Bob 7OM is back from VK4 after an absence of about 10 weeks. "Up there to work," so he said, but I notice he picked the winter months to go. Another "long time no hear" signal is from Brian 7BH, who I am told is baek on specifically for the Jamboree, but we're hoping he will continue to be heard not infrequently even after the said Jamboree.

Another one is Tiny 7JD whose signal at my QTH is in keeping with his physique—believe he has his shack finished now, so should hear more of him now.

Doug 7AB has moved from New Norfolk to Oatlands in the course of his employment, so some f.b. sigs should be heard from the lower midlands when he gets his antenna farm organised.

Crosby 7CW has not been sighted at the time of writing, but if he is going to schedule he should be home in about a week from now—probably got himself so much new gear they will send him on a special flight.

I've noticed on the round-up after the Sunday broadcast that the broadcast officer often has to ask for a repeat call from some sideband station that haven't quite given him time to switch the product detector in, so what about a little longer call you sidebanders!

After quite a few weeks of trying a sure path has been found by Eddie 7ZBM out of Tarraleah into Hobart on 2 mx, been getting 5 by 8 to 9 reports both ways, good work Eddie. Hope to work you myself soon.

Notice the Northern Zone President (Denny 7DK) has gone s.s.b. Heard him on 3.5 Mc. Don't know as yet whether he is using it on v.h.f. or not. Knowing Denny, I reckon he'll try it this coming season.

Incidentally, it's planned to have quite an auction (American)—as in American tea—at the Hamfest this year. Proceeds for the I.T.U. fund. So start looking out suitable items the other fellow might like to buy, and you're willing to donate! 73, Geoff 7ZAS.

HAMADS

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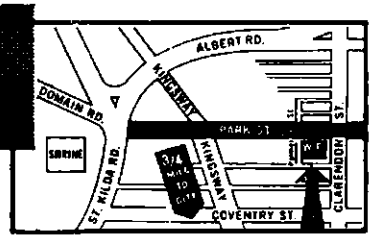

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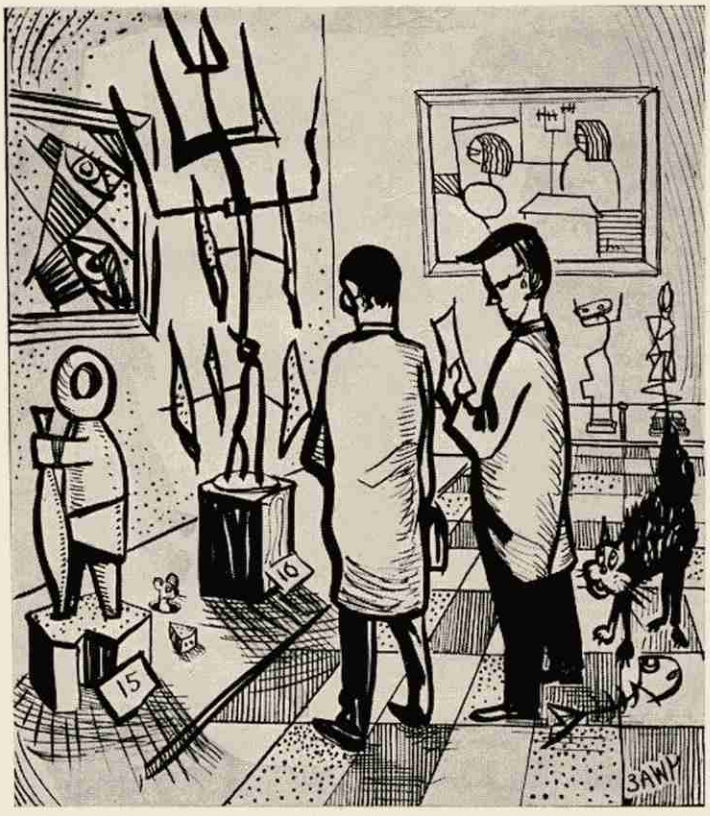

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1R5	16/-		6AJ5	7/6	3 a £1	6L7	5/-	5 a £1	7C5	5/-	5 a £1	57	5/-	5 a £1	9001	5/-	5 a £1	VR102	5/-	5 a £1
1S2	18/-		6AK5	15/-		6N7	5/-	5 a £1	7C7	5/-	5 a £1	58	5/-	5 a £1	AV11	2/11	8 a £1	VR103	5/-	5 a £1
1S5	10/-		6AL5	14/-		6R7	7/6	3 a £1	7E6	3/6	7 a £1	75	5/-	5 a £1	EA50	2/-	11 a £1	VR136	2/-	12 a £1
1T4	10/-		6AM5	15/-		6SC7	7/6	3 a £1	7W7	2/6	10 a £1	75A	7/6	3 a £1	ECC85	20/-		VR137	2/6	10 a £1
2A3	7/6	3 a £1	6AM6 (EF91)		10/-				12A6	3/-	7 a £1	725A	20/-		ECH35	20/-		VT78 (6D6)	5/-	
2C42	15/-		6AS7GT	20/-											EC135	7/6		VT127	5/-	5 a £1
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OUR COVER

"Personally, I don't like it, but I reckon it would load up OK on 2."

FEDERAL COMMENT

★

RETIREMENT AND AMATEUR RADIO

In this modern day and age, how many times are we asked "Have you made provision for your retirement?" Generally speaking, these enquiries are made by representatives of insurance companies anxious to sell us superannuation policies!

Finance is only one of the problems we must face when the time comes. One very important question which must be eventually tackled is how to spend all that time. Can you think of a more rewarding way of spending a large portion of that time than by the pursuit of Amateur Radio? Chatting away with friends all over the world—keeping abreast with life from the comfort of your own hearth? 'Tis then you will really appreciate the wonderful gift of friendship which Hamdom, with its lack of barriers, geographical, colour, creed or ideology, has to offer.

During the first flush of youth as an Amateur our enthusiasm runs to DX, Contests, Awards and late nights! A little later our greatest satisfaction is derived from the technical perfection of the home-built rig or the perfect aerial system. Then comes a time when the problem of providing for and raising a family dulls the interest in our hobby. Sooner or later the old urge reasserts itself and our excursions into Hamdom become more frequent with the emphasis on ragchewing, especially when our domestic responsibilities lessen.

Finally, comes the finest times of all—retirement—when we can achieve our greatest reward for a lifetime devoted to our hobby of Amateur Radio. We have all the time in the world at our disposal, have sound financial position and can then enjoy the pleasures which have never quite been satisfied before. At this time, in our twilight years, is perhaps the best time to give back something to Amateur Radio as well as take something from it.

This is the time when we can devote more time and energy to promoting better understanding and goodwill to our contemporaries in other countries, to cementing friendships born of casual contacts and in making new ones. This is an appropriate time of the year to be contemplating "peace and goodwill to all men", and in retirement we hope this sentiment carried down through the ages will be with you.

FEDERAL EXECUTIVE WISHES ALL AMATEURS A VERY HAPPY CHRISTMAS.

FEDERAL EXECUTIVE, W.I.A.

CONTENTS

Modifying F.M. Carphones for Multi-Channel Operation

J. W. SPICER, VK3ZEL*

THIS circuit is primarily intended as a guide to the conversion of the "old type" A.W.A. Carphone, which uses a 20-megacycle series type oscillator crystal, and the main object of the change is to bring these units into line with the later types of equipment.

This is achieved by re-wiring the oscillator chain and substituting a 10-megacycle parallel resonance crystal. At the same time provision is then made for switching to additional channels and providing individual frequency adjustment for each crystal.

When completed, the general circuit is similar to the later A.W.A. MR3A "Carphone Junior" circuit and the actual switching details may be adopted to convert these sets for multi-channel switching.

CONVERTING CARPHONE

To convert the old type Carphone, it is firstly necessary to re-wire the receiver oscillator chain in accordance with the circuit of Fig. 1. This involves the interchange of the existing 6J6 oscillator and multiplier with the 6AU6 tripler. In the re-arranged circuit, the 6AU6 becomes the oscillator and the 6J6 the doubler and tripler. It is suggested that some re-orientation of the sockets will be necessary for best wiring layout.

The circuit shows a second winding in the tripler coil can and this is an additional coil wound (with one turn less than the existing coil) loosely coupled to the existing single winding to also resonate at 120 Mc. (The slug in the original is removed.) If you feel so inclined a second winding in the oscillator plate coil will provide a means of increasing the spurious response rejection of the receiver (see insert diagram, Fig. 1), but several units have already been converted without this change and perform quite satisfactorily.

There is quite a fair amount of room in the Carphone receiver and space to house receiver and transmitter crystals and switch can probably be accommodated beside the receiver oscillator chain on a small sub-panel. The transmitter crystal oscillator circuit can be extended across to this point and a twisted pair is usually satisfactory for this purpose.

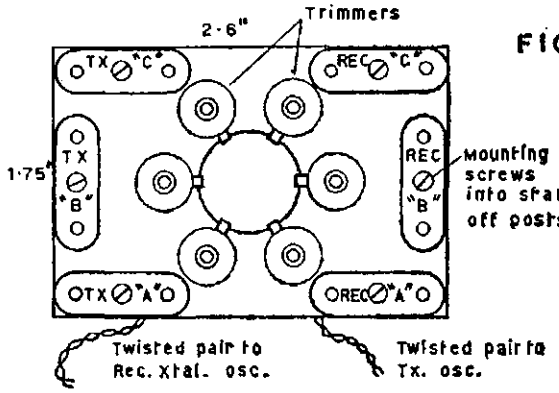
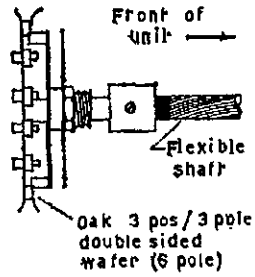


FIG. 2



A similar arrangement to that suggested for the MR3A "Carphone Junior" would probably be quite adaptable for the "Carphone" (Fig. 2) and a general description of this is given below. However, any suitable arrangement could be used and remote relay switching would be quite adaptable to any of the units.

SWITCHING IN THE "JUNIOR"

In the MR3A "Carphone Junior" multi-switching arrangements can be housed by mounting a small sub-panel above the microphone transformer. On this panel are mounted six "D" type crystal sockets and six of the improved Philips' trimmers (see Fig. 2). In front of this is mounted a double bank three-position three-pole wafer switch. This is housed in the space previously occupied by two electrolytic capacitors which are replaced with under-chassis pig-tail types.

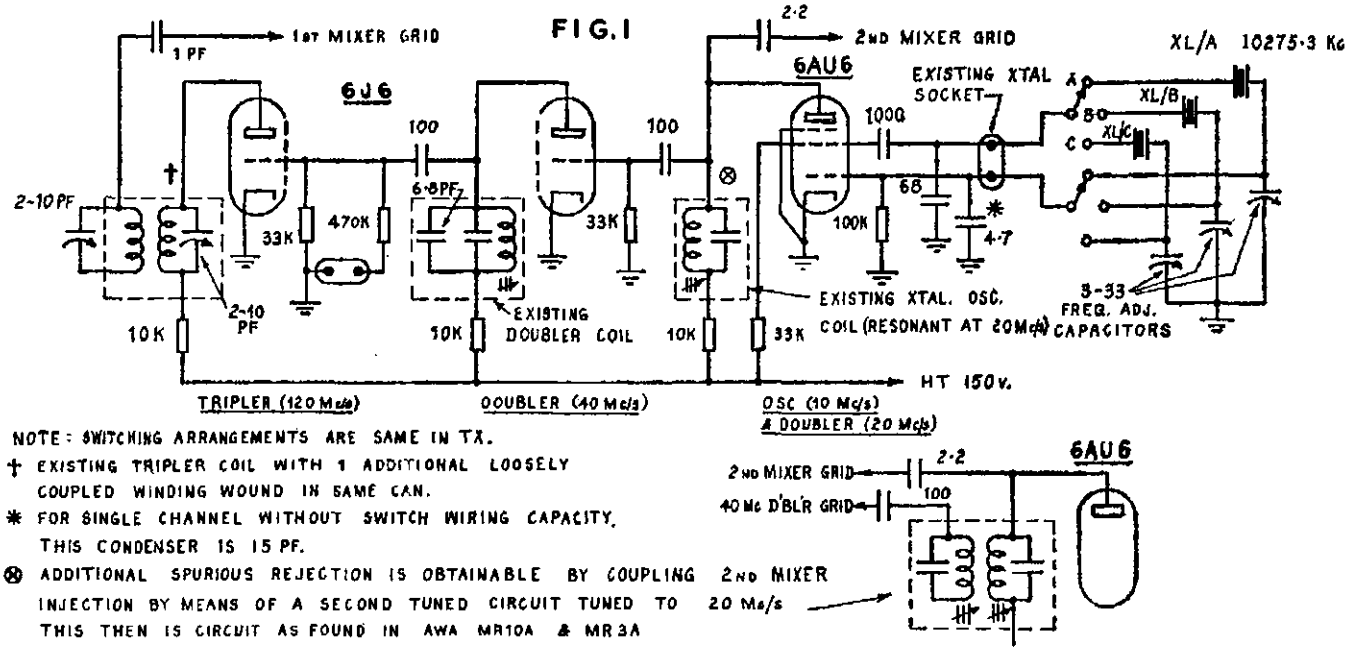
To help in wiring the sub-panel supporting the crystals and trimmers, a large cut-out hole (noval socket size) is made in the centre and the inter-wiring socket to trimmers, etc., passes through this.

A short flexible Bowden cable passes through a hole drilled in the "panel-lamp and switch bracket", and comes out at centre between the receiver and

(Continued on Page 16)

* 413 Stephensons Road, Mt. Waverley, Vic.

FIG. 1



NOTE: SWITCHING ARRANGEMENTS ARE SAME IN TX.

† EXISTING TRIPLER COIL WITH 1 ADDITIONAL LOOSELY COUPLED WINDING WOUND IN SAME CAN.

* FOR SINGLE CHANNEL WITHOUT SWITCH WIRING CAPACITY, THIS CONDENSER IS 15 PF.

⊗ ADDITIONAL SPURIOUS REJECTION IS OBTAINABLE BY COUPLING 2ND MIXER INJECTION BY MEANS OF A SECOND TUNED CIRCUIT TUNED TO 20 Mc/s THIS THEN IS CIRCUIT AS FOUND IN AWA MR10A & MR3A

USING THE OSCAR III. V.H.F. COMMUNICATION SATELLITE*

WILLIAM I. ORR, W6SAI

OSCAR III., the third in a series of space communication satellites designed and built by Radio Amateurs, is being tested in a pre-flight prototype package in preparation for a launch during the winter months of 1964. The Oscar III. satellite is a battery-powered high frequency translator[1] operating in the internationally assigned 2 metre band (144-146 Mc.) in accord with the new Amateur space allocation granted at the recent I.T.U. Space Communications Conference held in Geneva.[2]

In brief, the Oscar III. satellite permits two-way v.h.f. communication to be achieved by Radio Amateurs separated by the curvature of the earth (Fig. 1). The main portion of the transistorised equipment in the satellite listens to a 50 kc. segment of the 2 metre band centered about 144.1 Mc. and instantaneously translates this portion of the spectrum to a 50 kc. segment centered about 145.9 Mc., retransmitting the latter band segment to the ground observer. The satellite runs continuously, and an operational life of about one month is expected before the batteries expire. It is an aim of the Oscar Association eventually to launch a repeater of a similar nature with a higher orbit and longer operating life.

In addition to the wide-band translator, Oscar III. will incorporate two beacon transmitters. The first beacon will transmit on 145.85 Mc., and the signal will be the well known Oscar "HI" sent in Morse Code, followed by a burst of telemetering. Three separate measurements will be made within the satellite package and a simple system of pulse-width modulation will telemeter this information in sequence. The ground observer will be able to interpret the telemetered information with the aid of a 2 metre receiver and an inexpensive oscilloscope.

The second Oscar III. beacon will transmit a continuous unmodulated signal on 145.95 Mc. and will be useful for those experimenters wishing to make experiments requiring a phase-coherent signal. The two beacon signals will bracket the 50 kc. spectrum which contains the output from the translator (Fig. 2).

OPERATIONAL RANGE OF OSCAR III.

The operational range of Oscar III. depends, among other factors, upon the height of orbit above the earth. As this is unknown at the present time, it will be assumed to be about that of the earlier Oscar satellites (approximately 120 miles) until proved otherwise. Based on this figure and upon experience gained with Oscars I. and II., a radius of ground reception of the satellite turns out to be about 1,000 miles. Thus, two stations within 2,000 miles of each other are theoretically just within communication range via Oscar III. (Fig. 1B). At this distance, however, contact would be problematical, as the common communication area for both stations is extremely small.

Stations 800 miles apart or less, however, stand a much better chance of communication as the satellite remains within the common communication area for a greater length of time. Stations located along an east-west line, moreover, will generally have longer common communication time, as the Oscar III. satellite will probably have a north-south (polar) orbit.

The length of time the satellite remains within a common communications area between two stations depends upon the distance between the stations and the angle at which the satellite cuts across the area. For short distance contacts (stations separated by 500 miles or less, Fig. 1C) the satellite traverse time across the common communication area may be as much as six to eight minutes, whereas for extreme distances the traverse time may be a matter of only a few seconds.

USING OSCAR III.

Various types of experiments may be conducted by Radio Amateurs during the forthcoming flight of Oscar III. Passive, "listening experiments" are useful, as well as attempts to achieve two-way v.h.f. communication via satellite. In all cases, however, it is well to plan the operation in advance so that valuable time will not be lost during the period that the satellite is within radio range, estimated to be about eight minutes or less.

Telemetering Measurements: A more sophisticated form of telemetering is incorporated in Oscar III. than was used in the first two Amateur space satellites. The original Oscar beacon telemetered internal package temperature to earth by means of a temperature-sensitive element that varied the "HI" rate in such a way that a simple count of the rate by the ground observer could be translated into package tem-

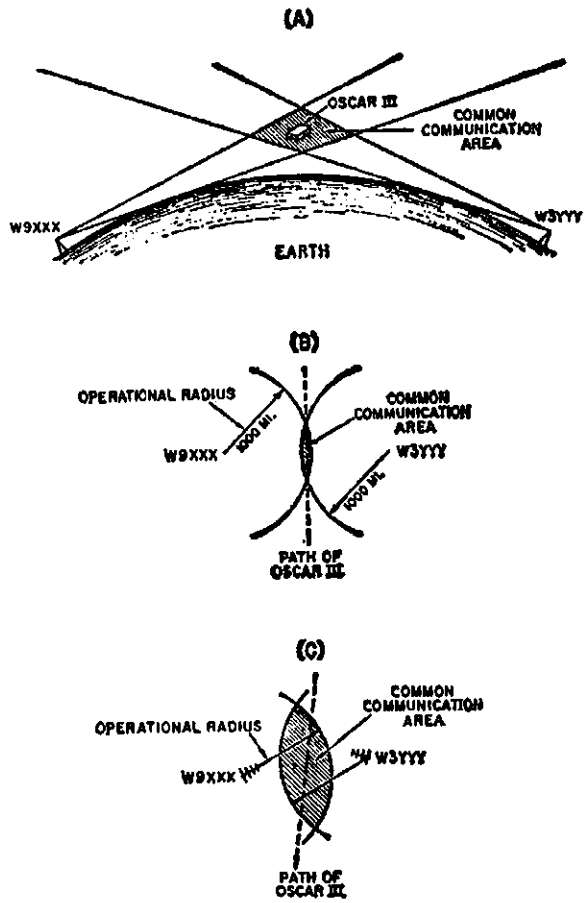


Fig. 1.

(A) A common communication area exists between two v.h.f. stations communicating via Oscar III. The area depends upon the distance between the two stations and the operational range of each station.

(B) Two v.h.f. stations within 2,000 miles of each other are theoretically able to communicate via Oscar III. if the satellite orbit is about 120 miles above the surface of the earth. At such extreme range, however, the satellite traverses the common communication area in a matter of a few seconds.

(C) As Oscar III. will probably have a north-south (polar) orbit, stations located on an east-west line will generally have a longer communication time than stations on a north-south line. The length of time Oscar III. remains in the common communication area depends upon the distance between the stations and the angle the satellite cuts across the area.

★

* Reprinted from "QST," August, 1964.

[1] Orr, "The Oscar III. V.h.f. Translator Satellite," "QST," February 1963.

[2] Jacobs, "Amateur Radio and the I.T.U. Space Communications Conference," "CQ," January 1964; "The Geneva Space Conference," "QST," January 1964.

perature. The "HI" rate of Oscar III. will be nearly constant and used only as an identifier, broken regularly by bursts of telemetering. The telemetering will consist of a series of pulses whose width will be a measure of the transmitted intelligence. Observing the ratio of pulse width to repetition rate on an inexpensive oscilloscope will provide temperature data. Several thermal points will be monitored within Oscar III. and the measurements will be transmitted in sequence, as will be described in a future article. The Oscar Association requests temperature measurement reports by interested Amateurs during the forthcoming flight.

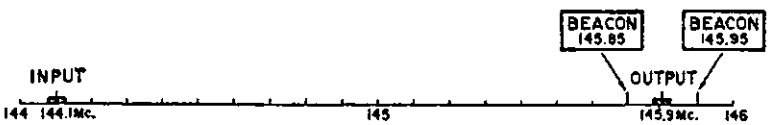


Fig. 2.—The 2 metre spectrum of Oscar III. The 50 kc. input band of the satellite is centered about 144.1 Mc. The corresponding output band is centered about 145.9 Mc. (inverted). Beacon transmitters are on 145.85 Mc. and 145.95 Mc., bracketing the output band.

Doppler Measurements: The 145.95 Mc. beacon may be used for Doppler data[3] by ground observers. The beacon emits a continuous, unmodulated signal, suitable for long-term measurements. It is hoped that some observers will maintain a 24-hour watch on this beacon, as various observations made on Oscar II. point to unusual modes of propagation that permit extremely long distance reception of the satellite, well beyond the usual line of sight. A continuously-running receiver coupled to a tape recorder may very well turn up a permanent record of long-distance reception by as-yet-unexplained modes of v.h.f. propagation. In addition, Doppler measurements may be made on this beacon to determine orbital parameters and predictions of future passes.

PASSBAND MONITORING

The translation equipment in Oscar III. will run continuously. When the satellite is in a quiescent state (no signals being received) the output of the translator consists of circuit and received noise, and may be readily identified by the ground observer as a hiss or "white noise" which covers the 50 kc. output frequency spectrum. The satellite may, in fact, be readily identified by this unique noise. When a v.h.f. signal of sufficient strength to activate the a.g.c. system of the satellite falls within its input passband, the output noise drops and the translated signal may be heard by a ground observer monitoring the output range of 145.875-145.925 Mc. As the satellite passes by, ground observers may tune back and forth across this range, logging signals within the passband that are repeated by Oscar III. Even though the observer possesses no transmitting equipment he will be capable of making a valuable contribution to the Oscar programme by monitoring the passband and logging all signals heard within the band. Copies of such logs should be sent to Project Oscar, Inc., Box 183, Sunnyvale, California, U.S.A.

It should be noted that signals passing through the translator portion of Oscar III. and received on earth will be subject to a Doppler shift occuring over two different paths. That is, the received signal will be a victim of Doppler shift as a result of the two-way transmission inherent in this system (Fig. 3). The translation circuitry of Oscar III. inverts the received signal so that the transmitted upper sideband of a ground transmitter will be repeated back as the lower sideband to a ground observer. This is done to reduce the combined Doppler shift to a value never greater than that observed by a simple one-way satellite-to-earth transmission.

It is possible, of course, that nearby ground-based signals occupying the satellite output frequency range may cause interference with the repeated satellite signals. It is hoped that Radio Amateurs will stay clear of the Oscar III. output frequencies during the pass time in a given location. Nontranslated earth signals in the output passband may be hard to identify although they will have no Doppler shift. Satellite-repeated signals generally will exhibit some degree of Doppler shift, but this may be less than the frequency shift commonly seen with many v.h.f. rigs using overworked surplus crystals!

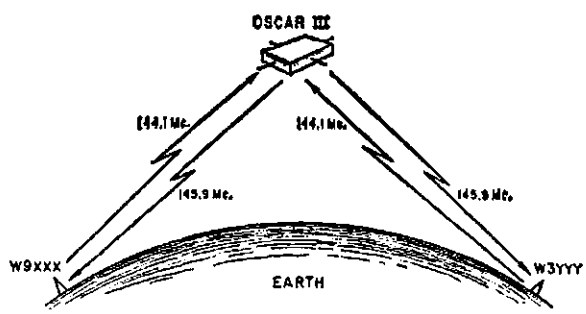


Fig. 3.—Oscar III. translates a v.h.f. signal from 144.1 Mc. to 145.9 Mc. Signals may pass both ways simultaneously through the repeater, which operates continuously during the life of the battery. Oscar III. inverts the received signal so that the transmitted sidebands are reversed within the satellite, thus reducing the combined Doppler shift to a value never greater than that observed by a simple one-way satellite-to-earth transmission.

TWO-WAY SATELLITE COMMUNICATION

The primary purpose of Oscar III. is to permit two-way Radio Amateur translator satellite communication beyond the normal v.h.f. range. Maximum communication distance is limited by the orbital height of the satellite, which will be unknown until after launch, but it is hoped that transcontinental or transoceanic contacts may be had by well-prepared Radio Amateurs. Experiments conducted by Amateurs living in the San Francisco area with a preliminary Oscar III. model, mounted atop a tower at the home of W6VMH, proved that the satellite permitted satisfactory two-way communication provided the users knew what they were doing and co-ordinated their efforts. Many of the users of the earth-bound Oscar repeater during this preliminary test were Oscar Association members, well versed in the working of the equipment, yet the thrill of the moment and the excitement of using a spectrum repeater led to chaos, confusion and unwanted interference until some form of discipline was planned in advance and a method of use established.

It must be remembered that the output power of Oscar III., approximately one watt, will be shared by all the signals passing through the repeater. As more signals pass through Oscar III. at one time, a point will be reached where each signal commands such a small part of the available output power that none of the signals is usable by the ground observer. The output spectrum of the satellite then becomes a confused, mumbling mass of "garbage". This may be expected to occur within range of areas of heavy v.h.f. population during week-ends when many stations may try to use the repeater. At other times, only a few signals will pass through the repeater as it orbits over other areas of the world.

One suggested means of making optimum use of the Oscar III. repeater is to take advantage of the "buddy" system. This requires two Amateurs to act as a team, with a predetermined operation sequence, or "script". A joint effort will help to ensure that when Oscar III. appears over the radio horizon an attempt at two-way communication may be made under circumstances that will encourage success.

For illustration, let us assume a hypothetical pass of Oscar III. between two v.h.f. stations that desire to achieve two-way satellite communication. The problem is defined in this manner:

1. When does the satellite approach the proper position between the two stations, and how long will it remain within radio range of both stations?
2. What will be the line of position of the satellite between the stations at it moves along its orbital path?
3. What should be the transmitting frequency of each station, and to what frequency should each station receiver be tuned in order to hear the satellite-repeated signal of the other station?
4. At what critical times will each station listen and transmit?

It would be reasonable to assume, until proved otherwise, that calling

[3] Norgaard, "Eyeball and Eardrum Doppler Tracking," "QST," April 1962 and June 1962.

[4] Burhans and Rankins, "Keeping Track of Oscar," "QST," May 1962. Hilton, "Making Your Own Orbital Predictions from Doppler Measurements," "QST," March 1962.

CQ at random and "looking across the satellite band" for a contact would be asking too much; at least until the would-be satellite DXer has experience gained in a prearranged schedule with a reliable, not-too-distant v.h.f. companion. The greatest chance of success would seem to stem from a predetermined sequence of operation enacted between two co-ordinated "buddy stations" who have practised their modus operandi aided, perhaps, by pre-launch low-frequency co-ordination schedules or by mail.

The Oscar Association emphasises that Oscar III. experiments in two-way communication differ in one important respect from other v.h.f. communication experiments conducted in the past by Radio Amateurs. Previous long-distance communication efforts based on propagation anomalies depended heavily on chance or luck for success. If the atmospheric diffraction was right; if the microwave duct was established; if the signal scattering was effective; if the unknown mode of propagation worked—the fleeting two-way contact was established on a hit-or-miss basis. Hours (or years) of work, largely with unknown, random factors, contributed to success.

This heuristic (cut-and-try) philosophy is absent in Oscar III. If launch is successful and the satellite equipment functions properly, alert Radio Amateurs using the proper operating techniques and equipment at the proper time and frequency can achieve two-way repeater communication. Propagation anomalies have little to do with it; Oscar III. is a "go, no-go" bird and affords predictable success to those Amateurs using it in a knowledgable fashion. Communication via Oscar III. is not something you try, it is something you do!

The Oscar Association will do its utmost to provide accurate and up-to-date tracking information. In addition, v.h.f. Amateurs and clubs who tracked the earlier Oscar satellites are urged to generate and disseminate their own tracking information for local consumption.

A QSO VIA OSCAR III.

By way of example, let's eavesdrop on a hypothetical 2 metre QSO via Oscar III. Remember, one of these stations may be you! Our two heroes are W9XXX in central Illinois, and W3YYY in western Pennsylvania, situated about 500 miles apart, on an east-west path. Each station is equipped with a stable, low-noise 2 metre receiver, accurately calibrated in kilocycles across both the input and output ranges of the Oscar III. satellite. In addition, each station is equipped with an auxiliary "early-warning" receiver, tuned to 145.95 Mc., the c.w. beacon frequency, or to 145.85 Mc., the telemetry beacon frequency.[5] The receivers may consist of two v.h.f. crystal-controlled converters feeding a stable low-frequency communications receiver.

Each station is equipped with a 100-watt output crystal-controlled 2 metre transmitter, the frequency of which is known to a kilocycle. In addition, each station has a medium-gain Yagi antenna (5 elements, approximately 10 decibels) rotatable in azimuth only, controlled by a second operator whose job is to keep the beam antenna aimed on the satellite by virtue of the early-warning receiver tuned to a satellite beacon signal.

Information from the Oscar Communication Centre has notified our two DX-perts that the satellite will pass approximately between them, on a north-south path during the time period of 1400-1407 G.M.T. The tactical situation is shown in Fig. 1C. W9XXX aims his antenna to the east of north, and W3YYY aims his antennae to the west of north.

Both stations have agreed beforehand to transmit on 144,110 kc. plus or minus one kilocycle. They know that the Oscar III. translator will invert their signals and retransmit them back to earth on 145,890 kc., ten kilocycles lower than the centre frequency of the output range. Initially, it is decided that W9XXX will start transmitting when he first hears the beacon signal, while W3YYY will listen for W9XXX at the proper satellite repeated frequency of 145,890 kc. As a starter, therefore, the early-warning receiver of each station is tuned to the satellite beacon frequency of 145.85 Mc. and the communication receiver is tuned to 145,890 kc. As the fateful hour approaches when Oscar III. comes within range, the two stations quickly run through their individual "scripts":

1. Clock properly set to G.M.T.? Yes.
2. Communication receiver tuned to 145,890 kc.? Yes.
3. Early-warning receiver properly tuned to 145.85 Mc.? Yes.[6]
4. Antennae positioned in the proper direction? Yes.
5. It is known that Oscar III. will approach the common communication area at 1400 G.M.T. on each station's clock, and it is agreed that W9XXX will start transmitting as soon as he hears the beacon. Since he knows that W3YYY will hear the beacon at almost the same instant, he has decided to transmit for 30 seconds, then he will listen for one minute at 145,890 kc.

Each station is ready. The growing tension is broken by the second operator at W9XXX announcing he has heard and identified the c.w. beacon of the satellite! The tape recorder is started, and a few second later, reception of the beacon is verified at W3YYY. The time for the record-making QSO is at hand! According to the prearranged plan, W9XXX starts to transmit, calling W3YYY on 144,110 kc. with slow, steady c.w., one eye on the G.M.T. clock. Five hundred miles to the east, the second operator of W3YYY tracks the satellite beacon while the first operator tunes a few kilocycles above and below the repeater frequency of 145,890 kc. He hears the "white noise" of Oscar III., and carefully listens for the c.w. signal of W9XXX re-transmitted back to earth via the space craft! Success is almost at hand when he finally hears a portion of W9XXX's transmission, clearly audible above the "white noise".

When the 30 seconds are up, W9XXX signs over and starts to listen near 145,890 kc. for W3YYY, while the second operator at W9XXX faithfully continues to track the satellite beacon with the early-warning receiver, making any necessary adjustments to the beam antenna to hold the beacon signal at maximum strength. W3YYY is calling W9XXX on c.w., and shortly, the operators of the latter station are thrilled to hear the translator-repeated signal of W3YYY calling them close to 145,890 kc.! W3YYY passes a signal report to W9XXX and the QSO starts to resemble a normal low-frequency contact. Finally, during W9XXX's reply, both second operators note that the satellite beacon signal is going out of range, and sure enough: contact between the two stations is abruptly lost as Oscar III. dips below the radio horizon. The first QSO via Oscar III. satellite has been successfully completed! The record-making QSO, moreover, has been recorded on tape at both stations and has become a permanent record of the unique accomplishment.

This, then, is one way the first contact via Oscar III. may be expected to be made. No doubt, sooner or later, some Amateur will call CQ and receive an answer at random via the satellite. It is hoped, moreover, that trans-oceanic and transcontinental QSOs will be achieved by this unique repeater satellite. As this is the first time such an experiment has been undertaken, all prophesies and predictions are, of course, based upon intelligent guesswork and may prove to be invalid. The possibility exists that the satellite may be badly overloaded near areas of intense v.h.f. activity and remain silent but receptive over areas of the world where little v.h.f. activity is present.

REMOTE-AREA "BEACONS"

It is hoped that Amateurs in areas of the world having little v.h.f. activity will supply beacon signals that will activate the satellite to alert other, distant observers. A v.h.f. beacon transmitter in the Azores, for example, may activate Oscar III. over the North Atlantic area so that such passes may be heard on both sides of the Atlantic. A similar beacon near the Fiji Islands and one near India will activate the satellite over Pacific and Asian areas.

It is readily apparent that this new adventure of Amateur Radio is a voyage into the unknown, and no member of the Oscar crew really knows all the answers, or has a complete picture of the capability of Oscar III. Surprises for all will be in store when Oscar III. goes into orbit, and Radio Amateurs world-wide join Project Oscar in looking forward to a successful launch and an exciting and useful life for this 30-pound package of surprises.

ACKNOWLEDGMENT

Thanks to Don Nargaard, W6VMH for advice and assistance in the preparation of this article.

AMATEUR FREQUENCIES:

ONLY THE STRONG GO ON—SO SHOULD A LOT MORE AMATEURS!

[5] In this article, satellite frequencies are given in megacycles, and ground station frequencies are given in kilocycles.

[6] In this type of short-distance pass, with the satellite between the stations, the over-all Doppler shift through the translator will be very small.

SOME ASPECTS OF SPURIOUS RADIATIONS FROM AMATEUR TRANSMITTERS

R. S. GURR, VK5RG*

FROM time to time Amateurs experience criticism on their transmissions from other Hams, broadcast listeners, television viewers and sometimes from the P.M.G. The criticism is usually the result of some mal-adjustment of the transmitter, or may be due sometimes to the poor design in the original construction.

I think we all know the implications of complaints of t.v.i. and b.c.i., etc., and generally are able to see the problem through to some satisfactory conclusion. The main point of this article is to awaken Amateurs to the implications of complaints from other Amateurs.

We are short of frequencies for our experimenting, and general communication, and we are at present setting up a fund to fight for their retention —even in this magazine you read the repeated motto—"Use them or lose them". Are you one of those who would like to use them, but find that some other local (or not so local) Amateur is already using them—not just one of them, but sometimes all of them? If you switch off after that initial look at the band and go back to the lounge, rest assured you are not alone in your disinterest in the bands—stay with me and I'll try to tell you how to help "use them".

Are you perhaps one who offends? Got a harmonic? Of course it's not your fault, it's the other chap's overloaded receiver! Got key clicks? Gosh, what do you expect when he's only 200 yards away! S.s.b. splatter? Course it doesn't, I'm using a 3 kc. filter rig!

You, my friend, are the reason, in your own innocent way for some of the locals not being so active—no, you don't keep them off all the time, but you do make them switch off sooner than they would if you weren't there! Hence, while we have a number wanting to "use them", some don't for a reason that is actually controlled by other Amateurs, i.e. spurious emissions.

DEFINITIONS

Now at this stage the bush lawyers come into their own, but for want of better guidance, the Geneva 1959 Radio Regulations definition is quoted as "Spurious Emission—Emission on a frequency or frequencies which are outside the necessary band, and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emission, parasitic emissions and intermodulation products, but exclude emissions in the immediate vicinity of the necessary band, which are a result of the modulation process for the transmission of information."

The emphasis here is on "necessary band", as the only radiation that is not a spurious emission. Suppose an s.s.b. transmitter is designed for 3 kc. bandwidth, and at a mile away occupies 6 kc., then the transmitter is obviously radiating spurious signals. Suppose at a mile, the key clicks from a c.w. transmitter are 50 kc. wide, then again spurious signals are being radiated.

As a third example, the 20 metre phone DX-er half a mile away is S6 on 80, S7 on 40, S6 on 21 and S7 on 28 Mc. These are also spurious emissions.

Of course, the bush lawyers now reappear and criticise the receivers on which these observations are made. We don't all use Collins 51J4s, Eddystone 880s, Racal RA17s, etc., complete with panoramoscopes, but we should know our own receivers—that is we know its r.f. bandwidth, i.f. bandwidth, cross modulation characteristics, and best of all we know its "S" metre reading is accurate! (If you don't know these facts about your receiver perhaps they should be checked as there may be room for improvement.)

Anyway, suppose we assume all measurements are made on a good receiver, and we satisfy these bush lawyers, we are then for the moment capable in this field.

Now all these spurious emissions will show up as harmful interference to other Amateurs using the bands. Again we let the I.T.U. tell us what "Harmful Interference" is—"Any emission, radiation, or induction which endangers the function of a radio-navigation service or of other safety services or seriously degrades, destructs or repeatedly interrupts a radio-communication service operating in accordance with these regulations." This means to me that radiation of "spurious signals" is not desirable because they can cause "harmful interference" to other stations.

We now introduce another term into our discussion, "Occupied Bandwidth" and this is "the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission . . ." In simple terms, the occupied bandwidth is that between the 3 db. down points of our transmission.

Of course, this referring back and forth to academic definitions is not really the point of this article, but if you can bear with me a little longer, we may learn a couple of points of great interest!

(1) In Commercial allocations, usually a morse code (c.w.) signal is allocated a 100 c.p.s. band, a d.s.b. a.m. signal 6 kc., and s.s.b. 3 kc.

(2) After 1970, Commercial transmitters should be operated with spurious emission 40 db. below the fundamental and with maximum spurious power of 50 milliwatts.

(3) After 1970, it is hoped there will be no d.s.b. fixed services below 30 Mc., i.e. all h.f. fixed point/point services, etc., will be s.s.b.

EQUIPMENT DESIGN

We now compare the Commercial designer's problems with that of an Amateur, to show how different the two problems can be, but how one's techniques can influence the other.

The Commercial has to design a communications transmitter to tune **any one** of a number of frequencies over the range 2 to 30 Mc.—preferably with a minimum of tuning ranges and controls—quick frequency change—spurious output restricted to greater than 40 db. below fundamental. The Amateur has an easier job. He has only to achieve this suppression on a very small portion of the h.f. band and can consequently incorporate techniques that are more easily built into an Amateur rig. The Ham who stops at 40 db. and goes no further is not to be condemned, but to achieve greater than this is relatively easier for the Ham than the Commercial.

The P.M.G. Handbook suggests we are allowed to radiate harmonics providing they fall in an Amateur band, but here again we are back to the original thought of interfering with other locals.

Hence, to keep our signals clean shows that we can do the following:—

(1) Keep the locals happy and help them use the band more often.

(2) Show the Commercials that we can equal or better their specifications.

(3) Let the P.M.G. know their rules are way behind the standards used by Amateurs.

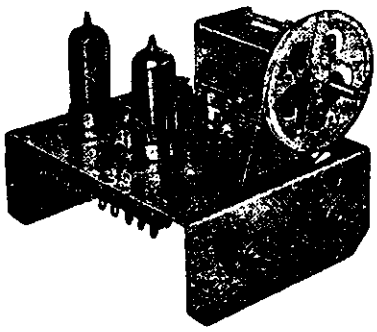
SOME CURRENT PRACTICES AND CURES

I venture now to discuss at random some of the shortcomings of Amateur transmitter design with respect to this spurious radiation problem. The tendency is due somewhat to the limited attention given in the various publications. In recent years shielding, bypassing and filtering techniques adequate for the suppression of v.h.f. harmonics have been developed and used extensively with great success to prevent t.v.i.

These designs, however, have not included much thought for the cure to radiation of lower frequency spurious signals. The >30 Mc. cut-off filters still let through the 3.5 Mc. harmonics to 30 Mc. and in some cases these spuriouses are mighty powerful. Some construction articles even include an antenna coupling unit as an afterthought! The use of fairly high power for frequency multipliers is still popular (6AG7, 5763, 6L6, etc.), and capacity coupling between these stages is

* 9 Richmond Avenue, Col. Light Gardens, S.A.

GELOSO V.F.O.



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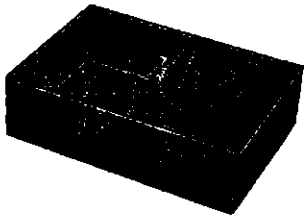

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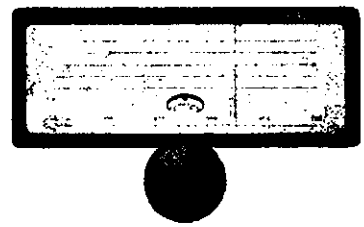

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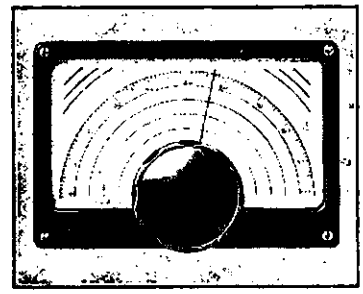

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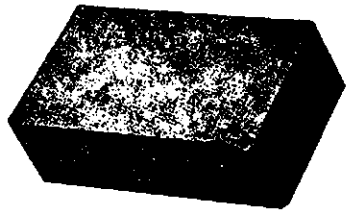

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I make open condemnation of the rig that uses a Geloso v.f.o. to drive an 807 or 6146 with a pi-network tank, coupled to a multi-band dipole. Brother, you have more total power coming out at spurious frequencies than you do at your fundamental! This type of line-up can be improved by using an aerial coupling unit between the p.a. and the multi-band aerial, and an even greater improvement obtained by installing a tuned buffer amplifier between the Geloso and the p.a. Driving any power amplifier with a frequency multiplier is not good practice, but if it cannot be avoided due to power supply economy, etc., the drive to the p.a. should be as pure as possible—the use of bandpass inductive coupling is satisfactory in most cases, and prevents too much of the multiplier's drive frequency from getting through to the p.a. grid.

As you know, the pi-network has some chance of preventing the transmission of harmonics of the amplifier drive frequency, but it has no chance of stopping frequencies below this design frequency if they reach the grid of the p.a.—once generated, these lower frequencies (sub-harmonics?) can best be stopped by an antenna coupler, but suppression to a very low level cannot be expected if this is the only circuit working to prevent their radiation.

I have no condemnation for the multi-band aerial, be it tri-band beam, multiple dipoles, long wires, zepps, etc., as these will not contribute greatly to the level of spurious signals if the spurious are not allowed to leak past the aerial coupler. The use of half wave filters to obtain further attenuation in difficult cases is also popular, while the inclusion in all transmitters of low pass filters with cut off at 30 Mc. is good insurance against spurious signals at v.h.f. with resultant freedom of interference to taxi services, t.v. channels, radio-telephone links, etc.

The generation of single sideband at a low level and the use of efficient linear amplifiers results in strong signals and fewer harmonics—here again, good exciter design in which only the frequency it is desired to amplify is applied to the p.a. grid, is essential. The use of an aerial coupler is again necessary to enhance the reduction of spurious signals.

SPURIOUS EMISSIONS NEAR THE TRANSMITTER FREQUENCY

Audio peak clipping, overmodulation indicators, low pass filters, etc., are all extremely useful to ensure the band transmitted is not excessive. There are plenty of good articles dealing with this aspect alone, written by reliable authors, elsewhere.

Key click filters, electronic keying systems and such are helpful in preventing keying transients. Why should the mere switching on and off of 150 watts of r.f. cause a click 10 kc. away from one transmitter and not from another? Every c.w. transmitter should have in its initial design the best key click suppression possible. Think of the others on the band—not only of the b.c.l's.

With s.s.b. most of the bandwidth restriction is done for us long before we hit the p.a. or linear. Here, however, a lot of s.s.b. rigs go wrong, and in this field just at the moment, more and more stations are offending. With filter rigs the narrow bandpass is built in usually, but I suppose one day someone will bob up quite legally with a 10 kc. passband filter rig and make everyone scratch their heads!

With the phasing rig, audio band suppression is essential before the phase shift network—that is, don't hit a 2Q4 or Aswel phase shift net designed for 300 c.p.s. to 3,000 c.p.s., with hi-fi—the result will be horrible and add up to more kilocycles of bandwidth than you ever used on a.m.!

SUPPRESSION TOLERANCES AND CHECKS

To measure the amount of attenuation with normal Ham transmitter design takes a lot of time and accurate equipment. Measurements in terms of decibels below the fundamental are easily obtained, but don't do it on your Ham receiver "S" meter or you will finish up with stronger spurious signals than fundamental. If you operate 20 metres and the local 200 yards away can hear you on 80 or 40 at S3 or better, you have more work to do. If he can hear you on 15, also return to your soldering iron, but if he complains of an S3 on 10, then he will have to put up with it, because this is good suppression.

If the local living at a mile hears you on any band but 20 metres, then you have not achieved all it is possible to achieve.

With respect to splatter and key clicks, if you throw all your selectivity in (and 500 c.p.s. bandpass is not impossible), tuning through a c.w. signal should produce clicks only when the signal is in the centre of the receiver bandpass—adjust the r.f. input (by aerial attenuator if possible) to the receiver until the "S" meter reads some high but normal value. (An "S" meter calibrated in db. above 1 μV. aerial input is the best in my opinion.) Now if the receiver is detuned 3 kc., and the key clicks are kicking up to a value 60 db. below the original, then obviously, although they still exist, the spurious signals are well attenuated.

This assumption can only be made when a receiver of "knife edged" selectivity is used, and for the purpose of the above observation, the "window" or "knife edge" are looking through at the frequency band of the transmission, is very much smaller than the actual transmission width. Taking this type of check even further, if we had a receiver of 100 c.p.s. bandpass and tuned 1 kc. away from the edge of "clean" 3 kc. speech transmission, we would see little "splatter" at all.

Checking your key clicks and splatter by this means can also be done by using the image of your own transmission in your receiver. If transmitting on 14 Mc., my own Eddystone 680X is of course blocked completely on this frequency, but when I tune it to 13.9 Mc., where the image is many db. down, I can view my own signal as that of a remote one. With crystal filter in and bandpass down to minimum, speech modulation and key clicks can be adjusted until listening 5 kc. outside the transmitter "occupied band", they are reduced to nothing. Try it sometime.

TESTIMONIALS

I unfortunately don't completely practice everything I preach in this field for a number of reasons. However, I list below some cases I have been involved in, wherein I have proved to myself and others, that it is posible to live with your Ham neighbour—even more so if he recognises his transmitter and receiver deficiences and corrects them:—

(1) Macquarie Island 1952 (VK1RG): AT20A transmitter, 400 watts of high level modulation on 14415 kc. At a distance of 200 yards, I could operate a 50 watt output a.m. rig on 14350 kc. with no mutual interference, i.e. I did not know the Commercial rig was on and neither were the Commercial operators aware of my 14350 kc. Amateur transmission. With an extension speaker on the Commercial receiver, I was able to observe the influence as the Ham rig was moved closer in frequency and came as close as 30 kc. away before any sign was noticed on the Commercial circuit. (14350-14400 kc. was still Amateur territory in those days.) On the Ham receiver, the 400 watt rig influenced reception 50 kc. or so from its frequency.

(2) VK5ZB/VK5RG, 1954-57: Steve and myself are 400 yards apart and we used at this stage 100 watts each and two element ZL Specials on 20 metres, each 30 ft. high. Beaming at one another, we flattened each others receivers over 80 kc. of the band, but with each beaming on the States, when beams end on to each other, we could work 20 kc. apart and unaware of the others activities.

(3) VK5ZL/VK5RG, 1954-57: Albert has more power than Steve, but is about 100 yards closer to me. We have existed together on the same band only 50 yards apart, on phone, and no need to close down! I beam right at him when I fire at the States and he at me when he fires to South Africa.

(4) VK5ZL/VK5ZB/VK5RG: The three of us have used 20 metre phone continuously in Remembrance Day Contests over the years and have simultaneously had contacts between 14100 kc. and 14200 kc. with Interstate stations and no mutual interference. There is no sign of either 5ZL or 5ZB at 5RG when I listen on 40 metres while they are on 20 metres.

(5) VK9RO/VK9XK: Russ and myself were about 400 yards apart in Port Moresby, both keen on phone and c.w. and also contests, yet no need ever to close down because the other was on the bands. I have worked stations on frequencies as close as 5 kc. from Russ on c.w. and we were each unaware of the other until later, when discussing our respective QSOs.

(6) VK9RO/VK9AT: Tests on 40 metres on a Geloso driving a pi-network to a 40 metre dipole coax. fed. VK9RO heard by Eddie at half mile on 20 metres at S8 signal. With aerial coupler, using Faraday shielded link on antenna coil, no sign of VK9RO on 20 metres.

(Continued on Page 16)

For More Sock in Your Signal, Build the . . .

ANTENNA ANALYSER*

HERB. FRIEDMAN, W2ZLF

WE know a fellow who abandoned his Ham gear for a while to spend his time sticking pins into the effigy of his next-door neighbour. Why? Because the neighbour's flea-power rig outperformed his super-duper, high-priced outfit every time.

If he had spent less time with the pins our friend might have realised all he had to do was get his antenna system tuned to razor's edge. Think it's a task to be dreaded? Well, listen. "E.I's" Antenna Analyser can determine antenna and feedline resonance, system impedance, s.w.r. and radiation resistance (antenna impedance) quicker than you can say voodoo!

The Analyser requires an input signal which can come from your v.f.o. or g.d.o. A one or two-turn coil placed near one of your transmitter's low-power stages, or from your g.d.o. coil, will pick up a sufficient signal for the Analyser.

The Analyser's range extends up to 30 Mc. and it will work with twin-lead or open-wire line. If you use coaxial cable, replace SO2 with a coax connector.

CONSTRUCTION

Except for M1 and SO2, use the components specified. If you use short direct leads and are careful about parts placement, the range can be extended up to 54 Mc. But on 2 metres, both M1 and R2 must be individually shielded with aluminium foil. Mount M1 as close as possible to the top of the U-section of a 5¼" x 3" x 2⅛" Minibox. This will leave the greatest panel area for the knob and calibrations.

M1 should be at least a 200 micro-ampere meter. If you can afford a 100 microampere meter, so much the better. Such meters are still available on the surplus market at low prices. Don't use an inexpensive imported in this application—they are too stiff for critical adjustments.

R2 must be insulated from the cabinet with a half-inch length of 3/8-inch i.d. plastic tubing. Cut the tubing so the ends are squared off. Coat R2's mounting bushing with Q-dope, taking care that it does not get into the control. Push the insulator on to R2's bushing (screw the mounting nut all the way on R2 first) and set it aside for a few hours. When the Q-dope is half-hard, carefully unscrew the plastic tubing and let the Q-dope in it dry overnight. When the Q-dope dries, one end of the tubing will have threading moulded in it. Re-coat R2's bushing with Q-dope and force the **unthreaded** end of the plastic insulator on R2. When the Q-dope dries, the insulator will be permanently attached to R2. Then push the plastic shift into R2 and fasten the assembly to the panel with a standard 3/8-inch panel bushing.

Position input connector SO1 and antenna socket SO2 so their lugs line up with R2's terminals. Make certain D1's polarity is correct and take care that it is not overheated when soldering. Complete all wiring except the connection from R2 to SO1 which will be made after calibration.

CALIBRATION

If you plan to use a g.d.o. as a signal source, use the resistor specified for R4. However, if you use your v.f.o. or a link pick-up from the transmitter, M1 may be driven off scale. To prevent this, change R4 to 47,000 ohms. If you think you may use either a v.f.o. or a g.d.o., R4 should be a compromise of about 24,000 ohms.

Set R2 full counterclockwise and connect an ohmmeter across it. Rotate R2 until the ohmmeter indicates 25 ohms, then put the 25-ohm mark on the front panel. Do the same for 50, 75, 100, 150, 200 ohms, etc., up to 500 ohms. Since R2 is linear, in-between points can be easily added. If you are only interested in a limited range of impedances (such as 25 to 100 ohms), use a 100-ohm pot. for R2. Full clockwise rotation will now correspond to 100 rather than 500 ohms.

After calibration connect R2 to SO1 and check the calibration by inserting **carbon** resistors in SO2. Connect the signal source to SO1. A v.f.o. can be fed directly to SO1. If you use a g.d.o., connect a one or two-turn coil to the Analyser and slip it over the g.d.o's. coil. Move the loop over the g.d.o's. coil until you get a maximum deflection on M1. Rotate R2 until M1 indicates a null. If the resistor connected to SO2 is 50 ohms, R2 should be opposite the 50-ohm mark. If the unit is correctly wired, the null will be at absolute zero or very close to it. If you get only a partial null, the wiring in the Analyser may be sloppy. If the calibration is consistently off, readjust the knob on R2's shaft or re-mark the dial. If calibration is off badly, look for a wiring error.

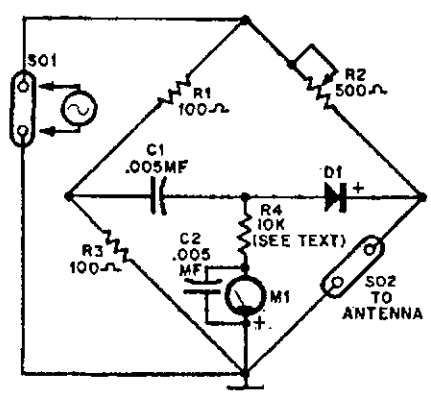

Fig. 1.—Simple bridge circuit is balanced when antenna system impedance is same as resistance of R2. Input voltage does not have to be held constant.

R1, R3—100 ohms, ½ watt, 1% resistors.
R2—500 ohms, linear-taper carbon potentiometer (I.R.C.—CTS45 Taper A).
R4—10,000 ohms, ½ watt, 10% resistor (see text).
C1, C2—0.005 μF. 500v. disc capacitors.
D1—1N34A diode.
SO1, SO2—Crystal socket or chassis-type coaxial connector.
M1—0-100 microammeter (see text).

OPERATION

You'll get greatest accuracy from the Analyser when it is connected to the antenna through a half wavelength (or multiple of a half wavelength) feedline. The half wavelength line acts as an impedance matching transformer. If you connect a 50-ohm impedance to one end of the feedline, the other end will appear as 50 ohms. (To keep the power-transfer loss low, feedlines should always be a half wavelength, or multiple thereof, long.)

Here's how you use the Analyser to determine the exact length of the half wavelength feedline. Cut the line a little longer than the calculated length. Connect the line to SO2 and feed a signal at your operating frequency to SO1. Set R2 to zero ohms and short the open end of the line. M1 will indicate up-scale. Cut off small sections of line then short the line. When the line is exactly a half wavelength long, M1 will null. (The length of a quarter-wavelength section of line is determined the same way except the free end is **not** shorted.)

Now for antenna measurements. Connect your antenna to the free end of the half wavelength feedline and rotate R2 for null. This setting is the antenna's radiation resistance (impedance). A complete null means the antenna is resistive and is precisely tuned to your operating frequency. If the null is not perfect, the antenna is reactive and not resonant at the operating frequency.

S.w.r. can be determined by dividing the antenna impedance by line impedance. If the antenna impedance is 100 ohms and you are using a 50-ohm line, the s.w.r. is 100 ÷ 50, or 2. If the answer comes out less than 1, invert the formula so the larger number is on top.

To use the Analyser to peak-tune an antenna or matching network, connect the antenna (with a feedline) to SO2 and set R2 to the desired impedance. Feed a signal at your operating frequency to SO1. When you have adjusted the length of the antenna or its tuning device (gamma-match) and obtained a null, the system will be properly tuned.

(Continued on Page 11)

TRANSEQUATORIAL PROPAGATION RESEARCH

C. G. McCUE*

THERE have been many reports since 1947 of unusual v.h.f. propagation over very long distances, sometimes exceeding 9,000 km., in directions more or less transverse to the equator. The frequencies involved have been as high as 90 Mc. during sunspot maximum and are usually in excess of any frequency which would be expected to propagate over these distances.

As an Australian contribution to the International Quiet Solar Year (I.Q.S.Y.) 1964-65, the Weapons Research Establishment, Department of Supply, has commenced a study of transequatorial propagation (T.E.P.) in collaboration with the Radio Research Laboratories (R.R.L.) of the Japanese Ministry of Posts and Telecommunications, the United States Army Signals Corps on Okinawa, and the Townsville University College (T.U.C.) in North Queensland.

* Box 1424H, G.P.O., Adelaide, South Aus.

No.	Call Sign	Schedules	Mc.
1	JA1YEN	A,B,C, D,E	49.00
2	JA1FG	F	
3	JA1ACZ	A,E	49.00
4	JA1DRB	F	49.00
5	JA1FUI	F	72.71
6	JA1JHA	A,C,F	32.85, 72.71
7	JA1MIB	E,F	49.00
8	JA2AC	F	49.00
9	JA2AUC	A,B,C, D,E	32.85
10	JA2BZY	A,B,C,D, E,F,G	49.00
11	JA2OLK	F	49.00
12	JA2CCY	C	49.00
13	JA3AER	F	49.00
14	JA3CEJ	F	32.85
15	JA4SF	A,E,F	49.00
16	JA4BPH	D	49.00
17	JA5ABY	F	49.00
18	JA7KC	F	49.00
19	JA7JE	F	49.00
20	JA7MA	F	49.00
21	JA7OR	A,C	49.00
22	JA7TI	E	49.00
23	JA7ZL	F	49.00
24	JA7AJI	F	49.00
25	JA7CCN	G	49.00
26	JA8FY	C	49.00
27	JA8PD	A,C,D,E	49.00
28	JA0DA	E	49.00
29	JA0KF	C,D,E	49.00
30	JA0AGA	F	49.00, 72.71
31	JA0AMH	F	32.85
32	JA0AXV	F	49.00
33	JA0ATY	F	49.00
34	JA0BDG	E,F	49.00

Table 1.

In part of this work, three 1kw. transmitters using Yagi aerials transmit on 32.85, 49.00 and 72.71 Mc. from Darwin and are received by R.R.L. engineers at Yamagawa in southern Kyushu in Japan. The transmissions are c.w. with the call sign VL5SA, repeated every ten minutes.

The author visited Japan during May and June in connection with this experiment. While there, he met Messrs. T. Kuwahara (JA1CR) and Y. Noguchi (JA1MKS) on behalf of the Japanese Amateur Radio League. They informed the author that many Japanese Amateurs have agreed to observe the Darwin transmission on a regular basis and to report their observations to Mr. S. Hara (JA1AN), who is organising this work. Mr. Hara will forward the reports to the scientists at R.R.L. The voluntary efforts of the Japanese Amateurs in observing the Darwin transmissions will add considerably to the knowledge to be gained from the Japan-Australia experiment. The Amateurs will present the scientists with data covering a geographical spread not otherwise obtainable.

Schedule Letter	Schedule
A	Observe on world days from 2000 to 2400 hours J.S.T.
B	Observe on world days from 2400 to 0300 hours J.S.T.
C	Observe on Sundays from 1000 to 1200 hours J.S.T.
D	Observe on Sundays from 1200 to 1600 hours J.S.T.
E	Observe on Saturdays from 2000 to 2400 hours J.S.T.
F	Observe irregularly but keep a log of times.
G	Use a pen recorder during observing periods.

Table 2.

Table 1 lists the call signs of Japanese Amateurs known by the author to be co-operating with Mr. Hara, the frequency which each will monitor, and the schedules which they will follow. The schedules are explained in Table 2. It should be mentioned that "World Days" are days when scientists and engineers in the fields of ionospheric physics, radio, geomagnetism, meteorology, aurora, cosmic rays, airglow, aeronomy, and solar activity make specially concentrated efforts to obtain data. World Days occur on three consecutive days each month, always a Tuesday, Wednesday, Thursday near the middle of the month. The World Days for September 1964 to December 1965 are listed in Table 3.

During the I.Q.S.Y., the Japanese Amateur Radio League is continuously operating three 50w. transmitters from Tokyo on 29.0 (A2 emission), 50.5 (A1), and 145.35 (F2) Mc. The aerials are simply horizontally polarised Yagis which rotate once a minute. The station call sign is JA1IGY.

It would be of great value to the author's research if some Australian Amateurs would monitor the two lower Japanese frequencies according to one or more of the schedules listed in Table 2. Any Amateur willing to do this should contact the author by writing to him at Box 1424H, G.P.O. Adelaide, South Australia.

The type of information required by the author would be the times when the operator attempted to hear the Japanese signal, the times when the operator could hear the signal, and an R-S-T report. It must be emphasised that reports of signal not heard when contact is attempted are as useful as reports of actual contacts.

Month and Year	Dates of Regular World Days
September, 1964	22, 23, 24
October, 1964	20, 21, 22
November, 1964	17, 18, 19
December, 1964	15, 16, 17
January, 1965	12, 13, 14
February, 1965	16, 17, 18
March, 1965	16, 17, 18
April, 1965	20, 21, 22
May, 1965	18, 19, 20
June, 1965	15, 16, 17
July, 1965	20, 21, 22
August, 1965	17, 18, 19
September, 1965	14, 15, 16
October, 1965	19, 20, 21
November, 1965	16, 17, 18
December, 1965	14, 15, 16

Table 3.

☆

ANTENNA ANALYSER

(Continued from Page 10)

Sometimes (as with mobile whips) you do not know what the antenna's resonant impedance should be. To determine it, connect the antenna to the Analyser with a half wavelength section, and set the generator to your operating frequency. Adjust the antenna as you turn R2 back and forth (at this time you are not interested in exact impedance) until you obtain a null at some setting of R2. The antenna is precisely tuned at the null. R2 indicates the antenna's radiation resistance. Knowing this, you can use the tables in the A.R.R.L. Antenna Book to determine the length of transmission line needed for a matched antenna system. Remember, it's only when the antenna system is matched and tuned for resonance that all transmitter power is coupled to the antenna. Don't forget that the Analyser must always be connected directly (or through a half wavelength line) to the device under test. ●

SERIES AND PARALLEL MODE CRYSTAL OPERATION FOR V.H.F.*

JOHN J. NAGLE, W3JES

● **This article describes the difference between series and parallel mode operation of crystal oscillators. Examples of both types of circuits are explained and a method is described for adjusting an oscillator for true series operation, frequently a difficult task, and a practical circuit is presented for 2 metre operation.**

AN interesting and informative article has recently appeared concerning the performance of overtone crystal controlled oscillators when operated in a high impedance or anti-resonant mode.[1] The use of overtone crystals in a low impedance or series-resonant mode offers several advantages over parallel mode operation. It is the purpose of this article to describe these advantages. This will be done by explaining the principal differences between series and parallel mode operation and examples of both types of circuits will be given. It is the author's belief that the biggest stumbling block to the use of series mode crystal controlled oscillators has been the difficulty in adjusting the oscillator for true series operation of the crystal. A method for doing this is also given.

The author of the above mentioned article describes the use of overtone crystals when operated in a high impedance or anti-resonant mode. The circuit described has the advantage of simplicity and economy of parts. However, it also has the disadvantage that the frequency is dependent on the capacity that is in parallel with the crystal. The major portion of this capacity is the input capacity of the oscillator tube; this capacity, in turn, is composed of grid-to-cathode capacity which is usually constant plus the grid-to-plate capacity multiplied by the voltage amplification of the tube (Miller capacity). Since the voltage amplification depends on the value of load impedance it can be seen that the frequency of oscillation depends on the load impedance.

SERIES MODE

Before proceeding further it is desirable to consider the difference between series and parallel operation of a quartz crystal unit. A quartz crystal unit may be represented by the circuits shown in Fig. 1.

The components L_x, C_x and R_x represent the piezo-electric effect of the quartz crystal. The capacitor C_s is a physical capacitance caused by the capacity of the electrodes on the crystal, the stray capacity of the crystal holder and socket, and the input capacity of the oscillator tube or other device connected across the crystal. At a frequency known as the "series resonant frequency" of the crystal, L_x and C_x are resonant. From the definition of series resonance the impedance of the $L_xC_xR_x$ arm becomes R_x so that the impedance looking into the terminals of the crystal is R_x and C_s in parallel. Typically, the value of L_x is several henries (not millihenries or microhenries, but **henries!**); R_x is less than 50 ohms for overtone crystals operating in the 30-60 Mc. range. (The author has measured the resistance of one 40 Mc. third overtone crystal to be 8 ohms!) Since L_x and C_x are resonant at the operating frequency, the value of C_x must be a small fraction of a micromicrofarad. As the inductance of L_x is several henries, the reactance at all Amateur frequencies will be in the order of several megohms. The ratio of a reactance of this magnitude and the relatively low resistance of 50 ohms or less gives a very high value of Q. ($Q = X_L/R_x$.) It is this exceptionally large Q that makes the quartz crystal so useful in frequency control and filter applications.

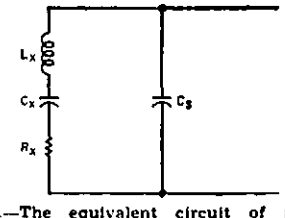

Fig. 1.—The equivalent circuit of a quartz crystal. The capacity Cs represents the holder capacity plus the input capacity of the oscillator circuit.

It should be noted that the frequency of series resonance depends only upon L_x and C_x which are intrinsic properties of the quartz crystal itself; this frequency does not depend upon the value of C_s and hence the frequency is independent of the circuitry in which the crystal is used.

PARALLEL MODE

If the frequency is increased from the series resonant frequency the reactance of the series arm becomes inductive; this is because the reactance of the inductance, L_x, increases with frequency while the capacitive reactance of C_x decreases with frequency so that the difference between the two is no longer zero but shows a net inductive value. At some frequency above the series resonant frequency, the inductive reactance of the series arm will become anti-resonant (or parallel resonant) with the shunt capacity C_s. This frequency is known as the "parallel resonant frequency" and the crystal circuit appears as a high impedance at this frequency.

A crystal controlled oscillator may be designed to operate at either the impedance rise at parallel resonance or the impedance dip at series resonance. The same design will obviously not operate at both series and parallel resonant frequencies.

Two points should be borne in mind: First, the parallel resonant frequency is always higher than the series resonant frequency. Second, the parallel resonant frequency depends on the stray capacity that the circuit places across the crystal while the series resonant frequency depends only on parameters of the crystal unit itself. If it is desired to operate a crystal at its parallel resonant frequency it is necessary to specify the value of load capacity that the crystal will see. Within the last few years this value of capacity has been standardised at 32 pF. for most applications. A crystal ground for parallel operation will oscillate at its name-plate frequency (within its tolerance) when the circuit presents a load capacity of 32 pF. across the crystal terminals.

Amateurs using surplus crystals, especially World War II. surplus, should use caution where accuracy of frequency is important. At the time World War II. crystals were manufactured, a standardised value of load capacity had not come into general use and where high accuracy was required it was customary for the crystal user to supply the crystal manufacturer with a sample circuit to which the manufacturer tailored the crystal. Since most Amateurs do not have access to equipment for accurately measuring frequency, especially in the frequency region where overtone crystals are most likely to be used, and since the input capacity of an oscillator tube is not easily determined, operation of the crystal in a manner such that the capacity across the crystal has only a small, if any, effect on the frequency of oscillation has certain advantages.

Typical examples of oscillators which use crystals in the parallel mode are shown in Figs. 2 and 3. Fig. 2 is perhaps the most commonly used circuit. It is a modified form of the tuned-grid tuned-plate oscillator in which a parallel resonant crystal is substituted for

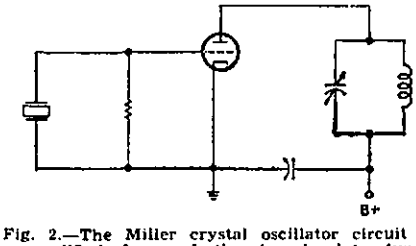

Fig. 2.—The Miller crystal oscillator circuit is a modified form of the tuned plate tuned grid circuit.

* Reprinted from "CQ," April 1964.

[1] Ellis, R., "Frequency Stability of Third-Overtone Crystal Oscillators," "QST," January 1963, p. 58.

the grid tank circuit and is known as the Miller oscillator. Fig. 3 is the well known Pierce oscillator and has the advantage that no tuned circuits are involved. Most of the other parallel mode circuits are modifications of either of the above.

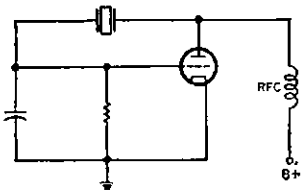

Fig. 3.—Basic circuit of the Pierce crystal oscillator. Note the lack of tuned circuits.

A good example of an oscillator using a crystal in its series mode is the Butler oscillator, shown in Fig. 4. Here the crystal serves as a series coupling element. At the series resonant frequency the crystal impedance is the lowest; the feedback is a maximum and the circuit oscillates at this frequency. At all other frequencies the crystal impedance is higher; since the crystal is a series element in the feedback path, the feedback will be reduced. If the circuit is properly designed, oscillations will take place only at the series resonant frequency.

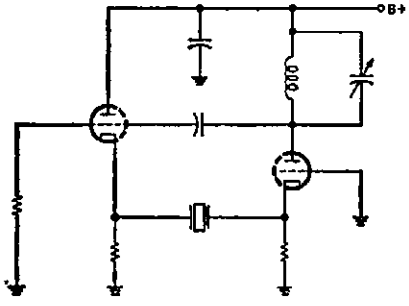

Fig. 4.—The basic Butler oscillator circuit uses the crystal as a series coupling element.

Perhaps a more familiar oscillator circuit using series resonance is the Clapp oscillator[2,3] shown in Fig. 5. Although this circuit is usually seen as a variable frequency oscillator it was originally developed as a crystal controlled oscillator for a broadcast frequency monitor. The characteristics of this circuit that make it so popular as a variable frequency oscillator apply equally well to the crystal controlled case.

There are many other circuit configurations using series mode crystals, too numerous to describe here. However, a modification of the Miller circuit to use series mode crystals will now be described.

As mentioned above, the series resonant frequency of a crystal will depend only on the crystal unit itself; the stray capacity across the crystal will have only a very minor effect on the frequency of oscillation. The Miller circuit can be easily adapted to use a crystal in its low impedance (or series) mode by use of an artificial quarter-wave line.

[2] "A High-Stability Oscillator Circuit," "QST," May 1948, p. 42.

[3] Clapp, J., "An Inductance Capacitance Oscillator of Unusual Frequency Stability," "Proceedings of The I.R.E.," March 1948, p. 356.

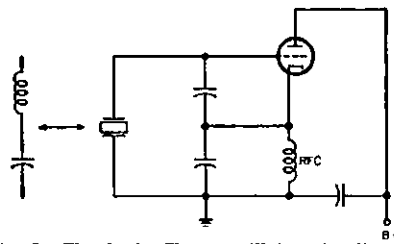

Fig. 5.—The basic Clapp oscillator circuit uses the crystal in the series mode. The L-C equivalent is also shown.

TRANSMISSION LINES

It can be remembered from transmission line theory that a quarter-wave section of transmission line has an impedance inverting property. In Fig. 6, if the load impedance Z_L is less than the characteristic impedance, Z_c, of the quarter-wave section, then the impedance seen at the input terminals of the line, Z_{in}, is greater than the characteristic impedance of the line. Mathematically:

$$Z_{in} = \frac{Z_c^2}{Z_L} \qquad (1)$$

The reverse is also true. The equivalent of a quarter-wave matching section can be made from lumped constants in the form of a pi-section network shown in Fig. 7 where X_L equals X_C at the frequency of operation. The characteristic impedance of such a section is given by $Z_C = X_L = X_C$.

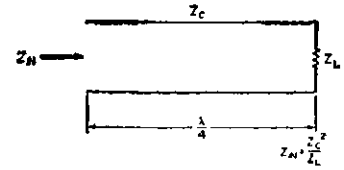

Fig. 6.—The impedance inverting characteristics of a quarter-wave transmission line.

For our purpose we will place a crystal, operating in the series mode, at one end of the network; this will be transformed into a high impedance looking into the other end of the network. The high impedance end will be connected to the grid of the oscillator tube as shown in Fig. 8. In order to obtain as high an impedance as possible at the grid end of the network, Equation (1) shows that (a) the crystal series resistance should be as low as possible, and (b) the characteristic impedance of the quarter wave section should be as high as possible.

Condition (a) above imples that the crystal unit should have as high a Q as possible. Condition (b) states that the shunt capacity should be as small as possible and the series inductance should be as large as possible, bearing in mind that the inductance and capacity must be resonant at the operating frequency. The minimum possible shunt capacity is equal to the input capacity

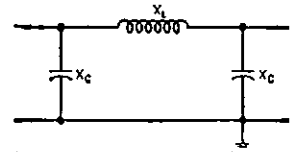

Fig. 7.—A lumped constant quarter-wave transmission line. At the operating frequency ZC equals XL equals XC.

of the tube, so that by making the input capacity of the tube the shunt capacity of the network, one physical capacitor is eliminated. In practical cases the series resistance of the crystal unit will be small compared to the reactance of the physical capacitor shunting the crystal so that this capacitor can also be eliminated. It is also necessary to add a grid resistor. The resistor can be put at either end of the impedance transforming network; since the crystal end has the lowest r.f. impedance, the grid resistor will be placed in shunt with the crystal. This will not degrade the performance of the crystal unit since a typical value of grid resistor is 100K ohms, while the series impedance of the crystal unit is typically less than 50 ohms. The circuit is now as shown in Fig. 9.

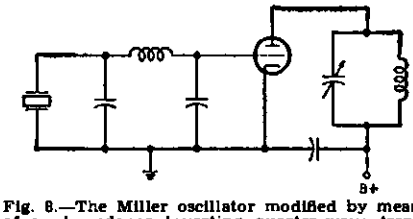

Fig. 8.—The Miller oscillator modified by means of an impedance inverting quarter-wave transmission line enables series mode operation of the crystal.

COIL DATA

The only problem that remains is to specify the coil. The coil must resonate at the operating frequency with the input capacity of the tube. As mentioned above, the input is difficult to determine exactly so that the coil must be made adjustable.

The impedance inverting coil used is ¼" long by ¼" diameter close wound with No. 20 enamel wire (8 turns); the slug is green-dot iron. If the best adjustment seems to be obtained with the slug in the maximum inductance position, the inductance is probably too small and the coil should be rewound

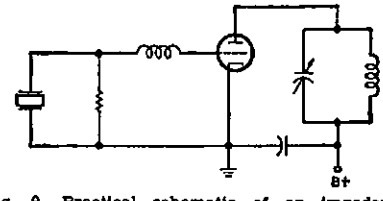

Fig. 9.—Practical schematic of an impedance inverting Miller oscillator.

keeping the same dimensions but using the next size smaller wire. If the best adjustment seems to be with the slug removed the coil is probably too large and it should be rewound using the next size larger wire again keeping the same dimensions. Keeping the same physical dimensions and changing only the wire size insures that the inductance is changed by controlled amounts. I have found that this is a better procedure than keeping the same wire size and changing the coil dimensions.

If the coil is to be made adjustable, some indication must be provided to tell when the proper adjustment has been made. It is believed that this "proper adjustment" problem has been

the principal reason that the performance of series mode overtone oscillators has not been as good as it should be.

ADJUSTMENT METHOD

When the oscillator is operating on the proper frequency, the crystal will be in series resonance and the r.f. voltage across it will be a minimum. Hence by placing an r.f. voltmeter across the crystal and adjusting the grid coil for minimum voltage, operation of the crystal at its series resonant frequency can be determined. For convenience, the voltmeter circuitry can be made a permanent part of the oscillator and a d.c. test meter connected to test points for tune up. A complete oscillator and voltmeter circuit is given in Fig. 10. The voltmeter has an input impedance of approximately 50K ohms; since the series resistance of the crystal unit is less than 50 ohms, the effect of the voltmeter is negligible. In fact, when testing, connecting the 500 pF. capacitor to the crystal no change in the oscillator beat note could be detected by ear.

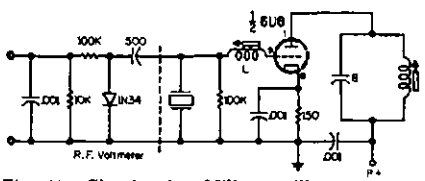

Fig. 10.—Circuit of a Miller oscillator modified with an impedance inverting quarter-wave transmission line and an r.f. voltmeter to aid in the adjustment of Inductor L.

The voltmeter also provides a convenient method of measuring crystal dissipation. The d.c. voltage developed across the 100K voltmeter resistor is very nearly equal to the peak value of the r.f. voltage across the crystal unit. The d.c. voltage is given by 100,000 I_{dc}, where I_{dc} is the meter reading in amperes. Hence

$$E_{dc} = 100{,}000\ I_{dc} \approx E_p\ (r.f.)$$

The power dissipated by the crystal, P_x, is given by:

$$P_x = \frac{E_p^2\ (r.f.)}{2R_x}$$

where R_x is the crystal series resistance. The dissipation for most types of overtone crystals in the 25-75 Mc. frequency range should be less than 2 milliwatts.

As a final test, before putting any overtone oscillator into actual operation, a receiver should be tuned to approximately one-third the name-plate frequency (assuming a third overtone crystal) for evidence of oscillation at the fundamental. Any signal output indicates that the crystal is oscillating at its fundamental frequency instead of the overtone frequency and that the oscillator tube is acting as a frequency multiplier. The output will therefore be high in harmonic content (harmonics of the fundamental) which would not be present if the crystal were operating on its proper mode. These harmonics are not only undesirable in themselves, but they represent energy that could better be used at the desired frequency. In addition, inadvertent operation of an overtone crystal at its fundamental frequency almost always results in excessive crystal dissipation which can cause a high drift rate or even damage the crystal.

The absence of any output at the fundamental frequency or multiples thereof (except of course the desired overtone and multiples of the desired overtone) insures that the crystal is operating in the proper fashion.

Use of the minimum voltage adjustment procedure previously described will give optimum performance of the oscillator.

Although overtone crystals are not capable of dissipating as much power as crystals operating in the fundamental mode, it is possible nevertheless, to obtain, from properly adjusted and controlled overtone oscillators, a reasonable amount of power with a minimum amperes; the crystal resistance was measured to be 15 ohms so that the crystal dissipation is less than 2 milliwatts. Thus in two envelopes it has been possible to use an overtone crystal oscillator, with the crystal operating well below its maximum ratings, to go to the two metre band with sufficient power output to drive a high power amplifier. This arrangement has an advantage as far as t.v.i. is concerned; no harmonics of the oscillator fall in a television channel and t.v.i. problems are simplified.

The same basic oscillator circuit can also be used in the 6 metre band with excellent results.

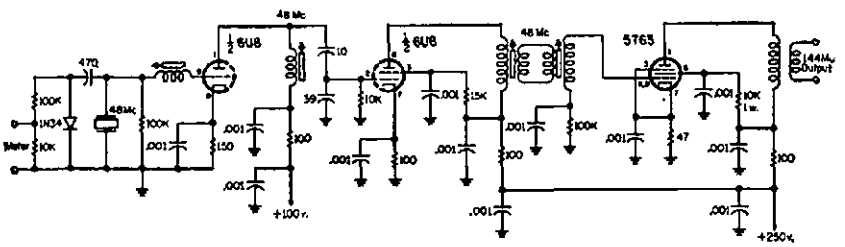

Fig. 11.—The oscillator-multiplier chain above uses a series mode overtone crystal. Only two tubes are required to provide an approximate one watt output in the two metre band.

number of envelopes. As an example, the oscillator-buffer-tripler combination used by the author to go from 48 Mc. to 144 Mc. is shown in Fig. 11. In this arrangement the triode section of a 6U8 is used as the oscillator operating on 48-49.3 Mc. The pentode section of the 6U8 is used as a buffer amplifier. The drive for the buffer is tapped down from the oscillator tank circuit to avoid overdriving the pentode section and to provide better isolation between the pentode and the oscillator. The output of the buffer amplifier is more than sufficient to drive a 5763 as a tripler to its full output of approximately one watt at 144-148 Mc. The d.c. current through the 100K resistor in the r.f. voltmeter circuit is less than 2 micro-

SUMMARY

In conclusion the difference between the series and parallel modes of a quartz crystal unit has been described; examples of oscillators using each mode have been presented. A modification of the Miller oscillator using an impedance inverting quarter-wave transmission line, and a method for adjusting the oscillator to true series mode crystal operation and for measuring the crystal dissipation has been given. It has further been shown that the series resonant frequency of a crystal depends only on the crystal itself, while the parallel resonant frequency depends on the capacity placed in parallel with the crystal. ●

F.M. CARPHONES

(Continued from Page 3)

transmitter indicator lamps on the front panel.

This system will allow for the three channels which at present are envisaged and/or operating in Victoria and N.S.W. and we hope other States will adopt these common frequencies as equipment becomes available to them.

F.M. NET FREQUENCIES

The present frequencies and crystals are as follows:—

Two Metre F.M. Nets
(for A.W.A. Carphones, etc.)

	Operating Freq. Mc.	Xtal Freq.* Receiver Kc.	Trans. Kc.
Chan. A	145.854	10,275.3	4,051.5
Chan. B	146.000	10,285.7	4,055.5
Chan. C	146.146	10,296.1	4,059.6

* Crystal requirements are to a tolerance of 0.0025% or better and the stated crystal frequencies are as measured with a load of 30 pF.

When ordering crystals, specify the equipment that it is to operate in.

Present occupation of channels is:—
Victoria .. .. A and B
New South Wales .. A and B

Suggested working arrangements for Victoria as the use of these channels increases:—

Channel A.—General working. Mobile to Mobile, Mobile to Base, Base to Base, but with **preference to general calling and Mobile to Base operation.**

Channel B (main W.I.C.E.N. frequency).—Mobile to Mobile, Mobile to Base, Base to Base, but with **preference to Mobile to Mobile contacts.**

Channel C (second W.I.C.E.N. frequency).—Base to Base, Mobile to Base, Mobile to Mobile, but with **preference to Base to Base contacts.**

All channels may, of course, be used in a real W.I.C.E.N. Emergency, but W.I.C.E.N. exercise traffic will move onto Channels B and C as these come more into use.

Six Metre F.M. Nets

Channel A .. .... 52.525 Mc. (active)
Channel B .. .... 52.645 Mc. (projected)
Channel C .. .... 52.765 Mc. (projected)

50 Centimetre F.M. Net

435.0 Mc. (active Geelong and Melbourne).

All channels and frequencies use normal 15 kc. deviation and frequencies have been "netted" to the stated frequency by the Melbourne P.M.G. monitoring station at South Morang. ●

☆

Spurious Radiations from Amateur Transmitters

(Continued from Page 9)

(7) VK5RG/VK5ZB, 1964: My 7 Mc. transmission via 70 ohm/300 ohm balun to 7 Mc. folded dipole produced an S8 20 metre harmonic at 400 yards. Using an antenna coupler in place of the all-band balun, the second harmonic was reduced to S3.

Hence I have proved to myself and have had proved to me that it is possible to live with your Ham neighbour. Next time you feel like switching off because yours is all over the place, have a look at your own rig, your own receiver, and then when you are sure your spurious signals are of a reasonable level, approach that neighbour and start up a conversation along these lines and try to convince him there is plenty that he can do to help.

Another big bonus won when lower frequency spurious signals are reduced is the additional chance of escaping b.c.i. complaints. Do you put up ten spots on the b.c. band when operating on 40 metres? Probably nine of them would go if you eliminated the 80 and 20 metre signals you are putting out simultaneously.

CONCLUSION

This is not a complete article in itself, but it is hoped it may spur some to have another look at the problem of spurious signals. It may also inspire some of the more scientific types to write to "A.R." and tell the fraternity just how to do it.

REFERENCES

(1) C.C.I.R. Documents of the 10th Plenary Assembly, Geneva 1963. Volume III. "Monitoring of Emissions".
(2) Report of the Radio Frequency Allocation Review Committee. 12th October, 1961.
(3) Radio Regulations, Geneva 1959.
(4) Handbook for Operators of Radio Stations in the Amateur Service. July 1962.
(5) Wireless Telegraphy Act and Regulations.

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST, 1965

Saturday, 6th February, to Sunday, 7th February

DATE

Saturday, 6th February, to Sunday, 7th February, 1965.

DURATION

From 1600 hours E.A.S.T., 6th February, to 1600 hours E.A.S.T., 7th February, 1965.

OBJECTS

The operators of Portable and Mobile Stations within all VK Call Areas will endeavour to contact other Portable/Mobile and Fixed Stations in Australian and Overseas Call Areas.

RULES

1. There shall be five sections in the Contest:—
   (a) Portable/Mobile Transmitting, Phone.
   (b) Portable/Mobile Transmitting, C.w.
   (c) Portable/Mobile Transmitting, Multiple Operators, Open only.
   (d) Fixed Transmitting Stations working Portable/Mobile Stations, Open only.
   (e) Reception of Portable/Mobile Stations.

2. All Australian Amateurs may take part. Mobile or Portable Stations shall be limited to an input of 25 watts to the final stage. This power shall be derived from a self-contained and fully portable source. A Portable/Mobile Station shall not be located within one mile radius from the home(s) of the operator(s), nor be situated in any occupied dwelling or building.

Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross-band operating is permitted.

3. Amateurs may enter for either (a) or (b), or both, in the Portable/Mobile sections.

4. One contact per station for phone and one for c.w. per band is permitted.

5. Entrants must operate within the terms of their licences and in particular observe the regulations with regard to portable operation.

6. Serial numbers consisting of RS or RST report plus three figures commencing with 001 and increasing by one for each successive contact shall be exchanged.

6a. Entrants in Section (c) for Multiple Operator Stations can set up separate transmitters to work on different bands at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001 and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the Operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

7. Scoring:—

(a) **Portable/Mobile Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .. .. **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .. .. **10 points**

For contacts with Fixed Stations outside the entrant's Call Area .... **5 points**

For contacts with Fixed Stations within the entrant's Call Area .... **2 points**

(b) **Fixed Stations:**

For contacts with Portable/Mobile Stations outside entrant's Call Area .... **15 points**

For contacts with Portable/Mobile Stations within entrant's Call Area .. .. **10 points**

8. The following shall constitute Call Areas: VK1 and VK2 combined, VK3, VK4, VK5 and VK8 combined, VK6, VK7, VK9 and VK0.

9. All logs shall be set out under the following headings: Date/Time (E.A.S.T.), Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed. Contacts must be listed in numerical order.

In addition, there shall be a front sheet showing the following information:—

Name.....Address.....
Call Sign.....Section.....
Call Sign of other operator(s) (if any).....
Location of Portable/Mobile Station.....
From .....hours to .....hours
From .....hours to .....hours

A brief description of equipment used, bands used and points claimed, followed by the declaration:

"I hereby certify that I have operated in accordance with the rules and spirit of the Contest."

Signed..... Date.....

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations and the Rules of this Contest or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Committee of the Wireless Institute of Australia is final and no disputes will be entered into.

12. Certificates will be awarded to the highest scorer in each Call Area. Additional Certificates may be issued at the discretion of the F.C.C.

13. Return of Logs:—

All entries must be postmarked not later than 7th March, 1965, and be clearly marked "John Moyle Memorial National Field Day Contest, 1965," and addressed to—

Federal Contest Committee, W.I.A.,
Box 638J, G.P.O.,
Brisbane, Queensland.

RECEIVING SECTION

14. This section is open to all Short Wave Listeners in VK Call Areas. The Rules shall be the same as for the Transmitting Stations. Logs shall take the same form as for Transmitting Stations, but will omit the serial number received.

Logs must show the Call Sign of the Station heard, the serial number sent by it, and the Call Sign of the Station being worked.

Only one lot of points can be claimed for any one contact between two stations, for example: VK2AA/P calling VK3XX/P and exchanging numbers. Points can be claimed only for VK2AA/P working VK3XX/P. No points can be claimed for VK3XX/P working VK2AA/P during this particular contact.

Scoring will be on the same basis as for Transmitting Stations. It will not be sufficient to log a station calling CQ. A station may be logged once only for phone and once for c.w. in each band.

Awards.—Certificates will be awarded for the highest scorer in each Call Area.

☆

IS THIS A RECORD?

(From "Radio ZS", June 1964)

ZS6BCX decided, when well on in his 70s, to take his Amateur licence. This inspired his daughter to follow suit, his son joined in as well. His grand-daughter and her husband refused to be left out, and also took their tests. Now the latter's son (the professor's great grandson) has taken a test to use his parents' rig.

This gives: ZS6BCX, 6BFO, 6BJN, 6BGB, 6BFN and the junior op.—all in one family.

Can anyone top that?

—WIA-L3042

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2. Phone Monitor.
3. Oscillating Detector.
4. Signal Generator.

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0-1 mA. .... **29/6** S.T. exempt
0-500 uA. .... **31/6** „ „
0-50 uA. .... **45/-** „ „

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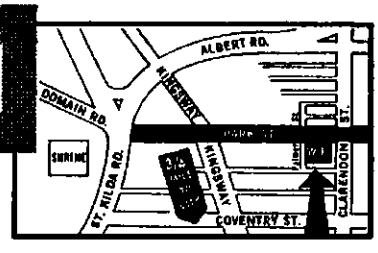

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The Historical Development of Radio Communication

PART ONE—INTRODUCTION

J. R. COX, VK6NJ*

RADIO communication is the modern expression of man's primeval need for communication with his fellows. Throughout the past, human beings have concerned themselves with hastening then extant means of communication.

The main purpose of this thesis is to trace the development of radio communication from its beginning to the present day. It does so by recounting how radio started, has, and still is improving to meet the ever-present need for greater efficiency in the transmission of information.

For the purpose of this thesis this search has been divided into:—

1. The era of experimentation.
2. The era of collation.
3. The era of formulation.
4. The era of commercial and technical expansion.[1]

It must at once be emphasised that the thesis is not concerned with an attempt to explain the theoretical phenomena of radio, but use has been made of technical data to enhance its meaning. The underlying theme is man's ingenuity in meeting the age-old challenge of communication by devising and improving on what he has thus far produced. Scientists and novices alike have responded to this challenge and the result of their labour, enthusiasm and experiments comes to us in the form of radio communication.

Through the ages, man has utilised a variety of methods to meet his need for communication. The electrical mode is the most recent way and before its advent man depended upon the more obvious media at his disposal. Resources utilised formed three main divisions, namely, physical means, visual means and means of sound. Forming the basis of the first-named section were runners and horsemen. Visual methods, employing the use of light waves, included lighted beacons and semaphore signalling arrangements. When news was transmitted over short ranges the shouted voice and drums, both taking advantage of sound wave radiation, were repeatedly used to good effect.

For over seventeen centuries the methods using physical means, sound and light waves served the purpose of communication well enough, but the pace of communication was slow and the range short. However, as exploration extended frontiers, the dispatch of communications over long distances in a short time became more important. In the closely settled European regions uprisings and the Napoleonic Wars emphasised the advantage of expeditious communication systems. At the same time the limitations of known methods became accentuated and this gave impetus to the investigation of communication systems with a view to improvement in reliability, secrecy, convenience and speed. Central Europe was

* Government School. Yornup, W.A.

[1] See Appendix 1 for chronological development summary sheet.

● "A.R." has been fortunate to receive from Mr. J. R. Cox a copy of his thesis "The Historical Development of Radio Communication". Due to space limitations, we are publishing the thesis in serial form during the next five or six months.

Although Mr. Cox holds the call sign VK6NJ, no claim is made that the series will be technical, but "A.R." feels that publication is warranted by the interesting nature of what Mr. Cox has written.

the originating point of this work, and it was from there that the notion arose of replacing tried media with a new invisible agent called Galvanic current,[2] now known as electric current. The initial amalgamation of the two—electric current and communication—occurred late in the 18th century and from it has come all our modern communication systems, including wireless.

The emergence of wireless communication from this amalgamation took a hundred years and covers what I have termed the "Collation Era".[3] During this time a long line of primary investigations yielded findings which formed the basic fundamentals upon which wireless operation depended. Hence men who were unaware of the feasibility of wireless equipment, or of wireless communication, assisted its coming. Galvani, Stephen Gray, Oersted and Faraday all belong to this group and are entitled to distinction as pioneers of wireless. Within the period of collation wire telegraphy was established and its growth assisted the development of wireless communication. It did this by providing tested components and technical know-how easily adaptable to wireless systems. Following the successful operation of wire telegraphy, the vision of a **wireless** scheme conjured speculation. In 1865 James Clerk Maxwell foretold the possibilities of electro-magnetic waves if they could be produced. His calculations predicted that electro-magnetic waves should be able to be sent over long distances through space. Maxwell's theoretical provision of an invisible connector between two points serves as a concluding mark for the period of collation.

Following Maxwell's postulations came Heinrich Hertz's practical verification of them. Hertz's work ushered in the commencement of the next stage stretching from 1874 to 1896, and which I choose to call the "Formulation Era".[4] This span encompasses the piecing together of the oscillator to generate electro-magnetic waves, the coherer to detect them and the antenna to radiate and collect them. In this period are featured the names of Hertz, Branly, Lodge, Popov and Marconi, the man who arranged these appliances to form the first practical wireless telegraphy system in 1896.

Two years after this Marconi introduced the first successful commercial wireless telegraphy system. From then on, the structure of expansion split into two sections, each paramount to the other, commercial and technical.[5] Companies were floated and the capital financed costly installations and manufacture. Under the patronage of commercial enterprise wireless communication at first developed mainly as a maritime service. Telegraphy messages were flashed from light-houses to Lloyd's of London and often from ship to shore and shore to ship. Naval ships were the first to experiment with ship to ship communication and Admiral Jackson's part in this bears mention.

As range extended, so did the use of radio. Trans-oceanic telegraphic services were inaugurated as were services to places hitherto inaccessible on land. The 1914-18 war was responsible for added demands on radio and wartime contracts for wireless equipment stimulated the industry and accelerated development. The advent of continuous wave transmissions, wireless telephony, aircraft radio and trial broadcasting to troops on the Western Front in 1917 are examples of this.

With the cessation of hostilities came a transfer of these innovations to peacetime use. Sufficient was known, for instance, to begin daily experimental public broadcasts from Konigswusterhausen, Germany, in 1919. In America Presidential election results were broadcast for the first time, in 1920, from Pittsburg. Here in Australia public broadcasting started in Sydney on 23rd November, 1923, when station 2SB commenced transmission from the Smith's Weekly Buildings. Western Australia's first broadcasting station was located in the Wesfarmers' Building, Perth. It opened in June 1925 and its call sign was 6WF.[6]

Wireless broadcasting rapidly grew as a dominating factor in communication to the masses. The United States of America, in 1922, had 60,000 homes with a wireless set installed. Eight years after the figure stood at 13,750,000, a gain of over 2,000%, with another prodigious increase of eleven and one-half million by 1950. Australian figures are for the number of licences issues and they also indicate vital growth. There were 63,874 licences issued in 1930, 312,192 in 1940, 1,841,211 in 1950.[7] A current estimate of receiving sets in the Commonwealth of Australia places the figure at just under eight million, representing several receivers per

[2] Named after Luigi Galvani, an Italian doctor who discovered current electricity in 1790.

[3] See Appendix 1.

[4] See Appendix 1.

[5] See Appendix 1.

[6] This information came from the 1925 Westralian Farmers Limited Handbook and Mr. W. E. Coxon, a departmental manager of that firm in 1925. He now resides at 11 Lapsley Road, Claremont.

[7] Australia, Tariff Board: Report on Radio and Television Equipment: 1959.

household and just under one receiver per person.[8] The world total of wireless receivers was surmised to be 350 million in 1957, and this figure, for the first time in history, exceeded the estimated daily newspaper circulation of 250 million. From an audience of a few in 1896 to 350 million in just under seventy years is a staggering truth.[9] There is no reason to believe that this is the ultimate. The coming of the transistor has, and still will, increase the accessibility of wireless communication.

APPENDIX 1

CHRONOLOGICAL DEVELOPMENT OF WIRELESS COMMUNICATION

The Era of Experimentation:

To 1700 The period of mounted messengers, vocal relays and visual means—torches, beacons.

The Era of Collation:

1729—Gray—establishment of electrical conductivity.
1789—Chappe—visual semaphore bar system. Von Sommering introduced electrical current as a means of signalling.
1820—Oersted established connection between electric current flow and magnetic field.
1831—Faraday discovered electro-magnetic Induction.
1832—Gauss—first successful two-wire electric telegraph.
1838—Steinheil replaced one wire by using earth as a return path. First successful one-wire telegraph.
1840—Morse introduced his code and key to send and receive wire telegraphy messages. This system of long distance communication made possible by magnetic relays working on principles of Oersted's and Faraday's findings.
1885—Maxwell mathematically explained Faraday's experimental findings. Prophesied electro-magnetic wave production and gave science a new means of regarding electrical phenomena.

The Era of Formulation:

1875—Bell introduced microphone and earpiece. First transmission of speech over wires.
1888—Hertz fabricated an oscillator to generate electro-magnetic waves and established, by experiment, veracity of Maxwell's thesis.
1890—Branly used a coherer to detect Hertzian waves.

The Era of Commercial and Technical Expansion

The Period of the Spark-Gap Transmitter

1895—Popov used a long wire to detect natural electrical magnetic disturbances.
1896—Marconi patented first practical wireless system. Gained longer range by using elevated wires as a transmitting antenna.
1898—First commercial wireless telegraph.
1899—First trans-Channel transmission.
1901—First trans-Atlantic transmission.

The Thermionic Valve Period

1904—Fleming—first thermionic valve. The two-element "Ionised Gas Detector".
1906—De Forest inserted the grid. First thermionic valve capable of amplification: "The Audion". Braun introduced out-of-phase excitation to give directivity to antenna. Dunwoody discovered crystal detector.
1913—De Forest, Langmuir, Hogan, Meissner introduced principle of self-oscillation and regenerative amplification using a triode valve.
1916—General Electric Co. inserted fourth element to valve for use in wireless telephony.
1917—Experimental broadcasts, Germany.
1918—Armstrong introduced heterodyne circuitry.
1919—Experimental broadcasts, U.S.A.
1921—First successful two-way trans-Atlantic wireless transmission using short waves.
1925—Appleton proved existence of ionospheric reflecting layers.
1928—Tuve and Breit evolved pulse method of determining reflecting layer heights. Yagi pronounced multi-element theory for gaining true beam effect.
1937—Armstrong concluded experiments on frequency modulation with the perfection of a satisfactory system which eliminated static.

The Transistor Period

1948—Shockley, Brattain, Bardeen introduced the transistor.
1958—Modular concept programme commenced in U.S.A.

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YOUTH RADIO CLUBS

Boy Scout Jamboree-on-the-Air created a great deal of interest and many hundreds of Scouts were on the air—a fine thing this, and everybody should support it. Amateur Radio, with field days and communication between groups, seems to fit perfectly with the work of the Scouts. There is a rich field here for those who can make the contact.

Most news this month is from VK2 and VK3 —thanks to their Newsletters. Have heard indirectly that there is a VK5 Newsletter but am not favoured yet.

The feature story, as you might say, is the interesting idea at Westlakes where Keith 2AKX and associates in the flourishing new club (membership now 45) are conducting a series of half-hour discussions between two stations, the first series on "Electricity and Magnetism," intended to serve as instruction for beginners. The frequency chosen is 1815 kc. so that any ordinary receiver can be quickly modified, and duplicated lecture notes and diagrams are available. This has great possibilities, and all interested in Youth Radio instruction should give serious thought to this.

Other VK2 news: Don 9DR gave a very interesting illustrated talk to VK2 Division meeting and showed much Y.R.S. work on Christmas Island. Ian Hopkins, of Illawarra Y.R.C., advises that the club has new quarters and the club station is on the way. Also, Charles Hoyer, of Unanderra, is taking part in the Duke of Edinburgh's Award and is making good progress. Graeme 2GJ has started a transmitting club with Kyogle Scouts with worth while publicity in local papers. Ian Guy, a teacher at North Sydney Boys' High has started a radio club and will probably try for his own A.O.C.P. Terry Crews, formerly of Gosford High, and Graeme Dennes, formerly of Taree High, have gained L.A.O.C.P. as radio apprentices with R.A.A.F. Radio School at Laverton (Vic.). Wal Bray, teacher at Canterbury High, has passed L.A.O.C.P.

Four Elem. Cert. at Inverell High—Bruce Thompson, Andrew Hemus, John Liston and Andrew Jackson. In all VK2, 13 Junior Certificates so far, one Inter., but no Senior, although 16 have jumped to A.O.C.P. 2YA and 2AVV are on the air each Tuesday at 4.30 p.m. on 40 metres with Y.R.S. information and competitions—all welcome. Vacation course for teachers on "Electronics in School Science" organised by Dept. of Education. Jacoby Mitchell, of Sydney, already employ Roger Blakey, formerly of Kingsgrove High, and are seeking another Y.R.S. graduate. Good vacancies in R.A.A.F. Radio Apprenticeship Scheme and in Dept. of Civil Aviation. "Careers Night" is being organised by Standard Telephones and Cables at their Alexandria works to attract Y.R.S. types. A simple tip for club leaders—one old i.f. transformer (iron dust cored) makes two inductive tuning units, when cut in half and usual 100 pF. capacitor in parallel replaced by about 300 pF. with possible reduction of turns in coil.

VK3 news: Macleod Radio Club leader, Ron Salter, has affiliated, also Yallourn Technical College, leader Dave Godfrey. Five girls from St. Anne's C.E.G.G.S. at Sale have passed Elementary—Bronwyn Robert, Anne Martin, Kathleen Byatt, Sharyn Budge, Barbara Knight —congrats. from all the boys to these girls. Graeme Orr, secretary of Warrnambool Tech. College Club, has persuaded a teacher (Mr. Hall) to help the club along. Eleven elementaries at Bundoora—Nicholas Cecic, Tim Daniels, John Coulter, Murray Enniss, Bernard Egan, Michael Gurry, Paul Healy, John Lowes, Alan Noyes, Geoff Sims, Kevin Glerney—their science master (Mr. M. O'Brien) is pleased at the profit. Secretary Geoff Nicol tells of Y.R.S. exhibition of gear at Greythorn High with many questions from parents. New club at Camberwell High, 15 students with instructor Mr. R. J. Hurle.

No direct news from "Uncle Charlie" in VK4 but you can be sure that live-wire Chas. is on the job. However, it's a very busy time in the schools just now because all important exams. such as Leaving Certificate and others are being held. Best wishes to our many members who are. I am sure, going to distinguish themselves, at least in the electronics department. 73, Ken 1KM.

[8] "Radio, Television and Hobbies," Sungravure Pty. Ltd., Rosebery, Aust.; Vol. 25, No. 8, November 1963, p.1.

[9] Gartmann, H.: "Science as History," Hodder and Stoughton, London, 1960.

NEW CALL SIGNS

AUGUST, 1964

VK1KW—A. H. Vonthethoff, 32 Rivett St., Hackett, A.C.T.
VK1QL—J. Weatherley, 25 Millen St., Hughes, A.C.T.
VK1US—P. R. O'Connor, 33 Colvin St., Hughes, A.C.T.
VK2ZJ—G. Kempton, 44 Robinson St., Kogarah.
VK2AGI—A. J. Jones, 10 McAlister Ave., Engadine.
VK2ATG—Kuringai Civil Defence Radio Club, Station: Kuringai Council Chambers, Gordon; Postal: 8 Braeside St., Wahroonga.
VK2AYD—D. G. Taylor (Sig.). C/o. 301 Sig. Sqdn., 11 Gormley St., Lidcombe.
VK2BCF—D. Searcy, 23 Government Rd., Beacon Hill.
VK2BSA—Boy Scouts' Assn. (N.S.W. Branch), Station: Baden-Powell War Memorial Camp, Pomona St., Pennant Hills; Postal: 285 George St., Sydney.
VK2BSC—H. D. Russell, 14 Moulden St., Speers Point.
VK2ZEF—R. E. Birley, 24 Goodchap Rd., Chatswood.
VK2ZMG—M. J. Garth, "Demelza," 24 Chester Rd., Ingleburn.
VK2ZPQ—J. A. Gardner, 4 Tobruk Ave., Allambie Heights.
VK2ZWL—J. P. Lowe, 1 Dunbar Close, Normanhurst.
VK3FP—K. A. Jays, 14 Second St., Mentone.
VK3OW—I. Tarbit, 19 Rosedale Rd., Glen Iris.
VK3ZCR—B. J. Alsop, 76 Dunblane Rd., Noble Park.
VK3ZDD—J. R. Torrington, 4 Thistle St., Pascoe Vale South.
VK3ZDF—P. Garde, 154 East Boundary Rd., East Bentleigh.
VK3ZFB—D. T. Bellair, 1 Mossman Drive, Heidelberg.
VK3ZIF—I. E. Stribling, Station: Armytage St., Lorne; Postal: 80 Cromwell Rd., South Yarra.
VK3ZJD—W. J. Darragh, 3 Freeman St., South Caulfield.
VK3ZKO—R. K. Von Sanden, 18 Parkside St., Malvern.
VK3ZLF—A. J. Jenkins, 217 Burwood Rd., East Burwood.
VK3ZSJ—B. K. Martin, 2a Shafton St., Huntingdale.
VK3ZTN—D. E. Stacpoole, 13 May St., Hamilton.
VK3ZWB—R. W. Bruce, 15 Tiller St., East Burwood.
VK3ZXH—M. F. Hayes, 14 Anderson Ave., East Ormond.
VK3ZZZ—D. G. Bills-Thompson, 6 Fairmount Rd., Hawthorn East.
VK4AK—D. D. Tanner, C/o. Mt. Isa Mines Ltd., Mt. Isa.
VK4BH—H. G. Brown, 29 Fraser St., Graceville.
VK4GC—G. A. Campbell, 33 Seaside Ave., Mermaid Beach.
VK4KN—K. G. Avery, 41 Brisbane Rd., Ebby Vale.
VK4MY—D. C. McDonald, 10 26th Ave., Palm Beach.
VK5DL—T. P. Drake, 13 Lindley Rd., Greenacres.
VK5MU—A. J. Pfitzner, 6 Bond St., Norwood.
VK5SR—S. Rae, 90 Halsey Rd., Elizabeth East.
VK5XG—G. N. Antuar, 40 Main St., Peterborough.
VK6JC—B. J. Coles, 22 London St., Mt. Hawthorn.
VK6NN—D. Ross, 46 Norma Rd., Alfred Cove.
VK6VW—R. B. Pemberton, 239 Jersey St., Wembley.
VK6WY—W. G. Wylks, 22 Margaret St., Cottesloe.
VK6XX—I. Kauler, Station: Narrogin Valley Rd., Narrogin; Postal: C/o. 6NA, Narrogin.
VK6ZAC—J. F. Chambers, 4 Lena St., Tuart Hill.
VK8NM—M. S. Lang, 4 Lambell Tce., Darwin.
VK9ZJD—B. J. Dodwell, Station: Vai Vai Ave., Boroko; Postal: P.O. Box 110, Port Moresby, T.P.N.G.

From Our Reading

"QST," September 1964

An interesting issue containing articles about a small five-band, transistorised converter for use in conjunction with a standard b.c. transistor set; the problems of increasing transmitter power in v.h.f. stations, with several suggestions; a stable, transistorised, heterodyne v.f.o. with output in the 160, 80, 40, and 20 metre bands; constructional details of Monimatch Mark III. and Mark IV.; the effect on directional patterns of tilted verticals; the use of 15 and 20 metre antennae on 80 and 40 metres; an unusual electronic keyer using a neon bulb relaxation oscillator as the timing element; and a description of a phase-lock detection method suitable for satellite or moon-bounce communication.

"CQ," September 1964

Apart from the usual monthly columns, this issue contains articles about a 6 metre J antena; neat packaging of a complete Ham station; modifications to the Collins 75S-1 receiver; a computer like push-button electronic keyer; part two of the series on Lasers; part two of R.t.t.y. from A to Z; and an interesting review of the Heathkit SB-300 receiver.

"Break In," September 1964

A three-band minibeam, called the VK6 Joybeam, is described in detail, and part 10 of the Receiver Series discusses noise limiters and S meters.

R.S.G.B. "Bulletin," September 1964

The first article deals effectively with a transistor pre-amplifier, includ. diode clipping, for use as a speech amplifier; and others include a description of a light-weight aerial feeder; a simple converter for 70 Mc.; and notes on the G2DAF s.s.b. receiver. Technical Topics deals, amongst other things, with silicon controlled rectifiers, tunnel diodes, a multiband dipole, transistor transmitters, and a transistor speech compressor.

R.C.A. "Ham Tips," Summer 1964

This issue details an interesting and unusual approach to a low cost, high efficiency, plate and screen modulator with an output of 50 watts.

"Short Wave Magazine," Sept. 1964

A number of interesting articles in this issue include a mobile/portable 2 metre transmitter using a transistor modulator; a simplified electronic keyer; a sensitive r.f. monitoring unit; part five of the series on the practical applications of semiconductors in the Amateur station; modification of an L-F band transmitter for the H-F bands; and a design for a ten-watt modulator with a restricted frequency response.

New Kind of Convention

The New South Wales V.h.f. and T.v. Group will hold their first Three-Day V.h.f. Convention on **5th, 6th and 7th March, 1965.** The programme will commence at 8 p.m. on Friday 5th at WI Centre, Crow's Nest. Bookings for accommodation can be arranged if desired. Programme and venue will follow in future issues.

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

JOHN MOYLE NATIONAL FIELD DAY CONTEST

Editor "A.R.," Dear Sir,

For some while now, the subject of how the Moorabbin and District Radio Club should participate in the multi-operator section of the John Moyle National Field Day Memorial Contest has been discussed among members.

These discussions culminated in a policy being determined at the Club's general meeting of 15th May, 1964.

We would like to use your correspondence columns to publicise this policy as it will affect Moorabbin members in field events over the next few years.

Since the 1961 National Field Day at least top honours in the multi-operator section have gone either to the Elizabeth Club VK5LZ or the Moorabbin Club VK3APC. During this period, we at Moorabbin, have viewed with some alarm the steady reduction in the number of small multi-operator groups competing.

We think this may in part be due to the growth of a feeling that the section has become the perogative of the large clubs. We have reached the conclusion, therefore, that in the best interests of the Amateur Service, the Moorabbin Club will, for a period, not compete as a club station.

Rather it will promote the entry of three or four smaller groups, each operating independently of the other, under the call sign of one of the group members, with each trying equally hard to gain the highest score.

As an added incentive, the club will donate a cup, to be known as the "Moorabbin Cup" to that group of its members attaining the highest score in the contest.

By these actions we hope to achieve the following objectives:—

1. Directly increase the number of multi-operator groups taking part.
2. Indirectly increase the number of groups by minimising the feeling—if it exists—that membership of a large and virile group is mandatory to success.
3. Promote the construction of a greater variety of portable/mobile equipment that could be used in times of emergency.
4. Give opportunities for organisation and operating to a greater number of club members.

All four of these aims are, we feel, those of Field Day Contests themselves, i.e. to provide a pool of operators and equipment that can be used in times of emergency. We feel that our best defence in the fight to regain lost frequencies—or even just to keep what we have—is to be able to render some public service. Emergency work of any kind is the best way to do this.

—Harold L. Hepburn, VK3AFQ, Secretary, Moorabbin and District Radio Club.

JAMBOREE-ON-THE-AIR

Editor "A.R.," Dear Sir,

I have before me my copy of "Amateur Radio" (October issue) and am delighted to see that you were able to use the block we sent along for the front cover of your very good magazine. At the same time I should like to thank you for the very excellent editorial which I feel went a long way towards helping make this year's Jamboree-on-the-Air such a successful venture.

Each year the Boy Scouts' Association is deeply indebted to the Amateur Radio movement, particularly the members of the Wireless Institute of Australia who rally to our call and without whom Jamboree-on-the-Air would just not be possible. Each year also, through this excellent journal, the Jamboree is given wide publicity and this year has been no exception.

I should like to take this opportunity, therefore, on behalf of the Australian Boy Scouts' Association and the many Cubs, Scouts, Senior Scouts, Rovers and their Scouters who gained so much enjoyment from the Jamboree-on-the-Air, of expressing our deepest and most sincere thanks. Thank you then, from our Chief Commissioner (Mr. C. R. Nichols) down to our humblest Cub. May we continue to enjoy this most happy association.

—Noel Lynch, National Organiser, Jamboree-on-the-Air.

CO-OPERATION

Editor "A.R.," Dear Sir,

During the month I received a letter from Bryan Prosser, L6028, who wrote on behalf of two keen S.w.l's in his area. These lads, 17 and 18 years of age, have been in wheelchairs for the past seven years, and up until June of this year were using an antiquated set for their listening. A lady of Claremont, in W.A., generously gave them a very nice receiver, but the lads found that, owing to their position, could not have easy access to the controls. Members of the W.I.A., W.A. Division, came and took the set away, cut the cabinet to size, completely overhauled the set, and returned it to the lads. Now the boys, who, by the way at that time were not members of the W.I.A., have been set up and can really enjoy our hobby. These lads have since joined as associate members.

This spirit of co-operation is a great inspiration to associate members, and is prevelant not only in W.I.A., but also in other States, as each month I hear of some S.w.l. who has had assistance from fellow members.

Recently I placed a request in the VK2 monthly "Bulletin" for a receiver for a junior S.w.l. A Mr. Adams of Toukley, some 70 miles from my QTH, kindly offered to give, and rail the set to me. I informed Mr. Adams that I was going to Newcastle, so he personally took the set to the address to where I was going, which was about 30 miles from his QTH.

No doubt many of our members could tell of such help, but I felt that I must let these two fine gestures be made known.

—Chas. Aberneathy, L2211.

D X

VP4, OA4, BV, ZM7, 7GI, FP, AC5, MP4, ZC6, TY2

Sub-Editor: H. A. BEHENNA, VK5BB,
14 Stanley Street, Crystal Brook, South Aus.
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Over the past month or so, the bands have shown a decided improvement, DX-wise. While there are more openings to the various parts of the world, there is, however, the erratic nature of each band. One never ceases to wonder just what he will hear next and from where it will come. Listening is still the ace key to getting the results! With good operating and good clean signals, you will become popular on the bands and will be sought after.

Activity on 14 Mc. seems to indicate that this band is still the old reliable, but 7 Mc. seems to be gaining in popularity from many of the boys, whilst 3.5 Mc. is showing some promise on occasions. 21 Mc. is either open wide or closed, and it's a bit hard to follow its habits. It takes a contest to show whether these bands are workable or not. During the recent contest a tune over 14 Mc., during the pre-lunch period or around midday local time, the following stations were heard: VU, AP, JA, KG, KW, HL, 9M, HM, 3W8, VK0, KC4, ZL, VR, KC, KX, KR, etc. On any normal day, about the only thing one can hear is VK or ZL. This undoubtedly proves that it is lack of activity rather than bad band conditions.

ACTIVITIES

3.5 Mc. is now proving its worth for those who would like to give this band a go, especially around 1200z, on various evenings one can hear the South Americans, Peru, Columbia and most of the U.S. areas.

YN1AA, of Managua, Nicaragua, on this band seems to attract a lot of attention, but he is always busy working break-in traffic on high speed Morse.

The A.R.R.L. announce a further addition to their D.X.C.C. Countries List with the Saudi Arabia/Iraq Neutral Zone. Operation from this Zone is taking place from this area with the prefix of 8Z4.

HM2BD reports that he is the only HM2 who has a permit to operate on 14 Mc. s.s.b. For QSL: P.O. Box 8, Sosa, Korea.

UB5UN had a visitor in the shack, namely Bob W8NRB/UB5, who is with the American Exhibition at Kiev. They are very active, and around Xmas are moving to Moscow, and will become /UA3.

K5CDA/MM is on the S.S. Cathy, which is cruising in Far East waters.

VS8FH and VS6FJ, at Hong Kong, had their vertical antennae both brought down by the typhoon "Viola".

UW1KAE is a good one to catch, as he is on Franz Josef Land. Reported to be using a frequency of 7020 kc. app. 2300z.

VQ1GDW, operated by K1IGO, is the only station in Zanzibar, and says there are no prospects of new calls for some time.

Jack KW6EJ calls CQ most nights on s.s.b. at 14250 kc., app. 1030z.

Wally W6BHM is by far the most consistent from the States on 21 Mc. on the high end on s.s.b. If Wally is on you can hear him around 0200z.

W9TQY, of Winfield, is back on the air after some years of lay-off, and is enjoying catching up on the "tube type" prefixes.

ZS1PP on 14 Mc. phone has worked a number of our members, and is the call of John Barnard, located at Cape Province, Republic of South Africa. He runs a Geloso, 6146 and a cubical quad antenna.

Charles Thorpe, L4018, reports hearing JA-1GHV calling CQ on 28 Mc. s.s.b. He was 5 by 5. Time 0330z, no contact was made.

Quite a pile up was caused by Archie VQ6R when he answered a CQ from a VK on 14 Mc. at about 0530z; works s.s.b.

Crozet, FB8WW: 14 and 7 Mc., a.m., s.s.b.
Campbell, ZL4JF: 7 and 14 Mc.
Amsterdam Is., FB8ZZ: 7 and 14 Mc.
Norfolk Is., VK9RB: 14 Mc.
Amer. Samoa, KS6BL: 14 Mc., A1, 0600z.
Marcus Is., KG6IF: 14250 kc. s.s.b., 1500z.
Nepal, 9N1MM: 14 Mc. A1, s.s.b, 1000z.
Muscat, MP4MAH: 14 Mc. A1, s.s.b., 1000z.
Oman, VS9OC: 14295 kc., 1900z.
Trucial Oman, MP4QBF/MP4T: heard on 7 Mc., 2000z.
Saipan, KG6SZ.
Congo, 9Q5AB. No frequency available.
Bechuanaland, ZS9A: 14 Mc. s.s.b. One year's operation.
Liberia, EL2F: 14 Mc. s.s.b., 1900z.
India, VU2GV: 14 Mc.
Cameroons, TJ1AC: 14 Mc. s.s.b.; also active is TJ8AL.
Singapore, 9M4ME: 7 and 14 Mc.
Tadzhik, UJ8KAA.
Falklands, VP8HJ: 14 Mc. s.s.b., 0800z.
Yemen, 4W1E: 14 Mc. s.s.b.; also 4W1F on 7005 kc., 2000z.
ZL1ABZ QRT in November.

Ex-VK Rex Vidicombe, is now EL2F on 14260 kc. s.s.b., running 1kw. in Liberia.

TR8AD, Max, is on from Gabon around 14040-50 kc., 22-2300z. QSL to Box 1025, Libreville, Gabon Republic.

LU1ZC is operating from Deception Is. in the South Shetlands. His usual frequency is 14048 c.w. and he's been heard both at 0300 and 1200z.

FB8WW was heard at 1200z operating on both 14045, listening up 3, with a beam heading of 330 degrees.

Ascension, ZD8BB: A DX40 has been sent to him to replace a borrowed rig. Op's name is Ray. QSL via W7ZMD. Also active is ZD8WR, reported on 21 Mc. s.s.b. about 1930z.

Easter Is.: C.w. and s.s.b. operations scheduled to start about Dec. 1, possibly late Nov. Bands 80-15 and possibly 10. Using Hallicrafters gear and Hy-gain beam. Anticipated freqs. are c.w. 3502, 7002, 14002, 21002; s.s.b. 7097, 14125, 21400 (listen as directed). On last trip to Juan Fernandez, 15 mx was open for longer periods than 20, and reports are that this will again be the case. So advice is watch 15 closely, particularly on Saturday and Sunday, 1700-1900z. Operators are Ed Cushing (W4QVJ) and Bill Eitel (W8UF). QSL via W4QVJ, Box 8045, Jacksonville, Florida 32211, GMT, s.a.s.e. (I.R.C.).

The world's greatest DX-peditioner, now known all over as Sir Gus, W4BPD, is reported ready to leave for Asia, and hopes to be active with several prefixes, viz. JY, ZC6, YI, YA, 9K2, etc.

Don Reed, VK9DR, Radio Officer at Christmas Island, left Melbourne 10th Nov. with his XYL to return to his 64-square mile dot in the Indian Ocean. Don expects to be active only on c.w. until late in December when he expects to receive his sideband tx back from VK3. During his leave in Australia, Don and XYL visited VK2, 3 and 4. He will be on Christmas Island until mid 1966.

STATIONS, COUNTRIES AND ZONES WORKED

From John VK5LV: 14 Mc. s.s.b., JA3API/MM, OH1NA, VU2WZ, KA9MF, 4S7YL, 9M2AF, I1ZJG, JA2AJV, KR6BF, HC2JI, YV4CI, Ws.

From this QTH: KC6BK, KG6APJ, HM1AX, 9M4JW, HC5EJ, KH6BVS, ZL1AH, HC2LDA, VQ6R, KA2RG, YV5BQF, YV1LA, Ks, Ws, KR6FY, UB5UN, KW6EB, KA8JM, DU1EH, XR2ES, K7LMU/3W8—all on s.s.b. 14 Mc.

There appears to be some confusion regarding the QSL of K7LMU/3W8. Please take note that you QSL to K6EVR and not K6ERV. The correct address is Ron Camp, 9861 E. Estrella Avenue, Temple City, California, U.S.A.

From David VK3QV, reports of 21 Mc.: Bad noise at his QTH whilst beaming to Europe and is causing him some concern and makes for tough going. However he has worked the following: s.s.b. HC2JT, HC2ALT, HM5CO, JA1-7, KA2LD, KH6JQ, KH6FAH, KJ6BZ, KR6AF, KR6BF, KR6FY, KR6OJ, KZ5AW, W/K 3-0, XW8AL, 9M2LO, 9M4LP, 9M4LX, K7LMU/3W8. Also some JA and DU1MR on a.m. Phone heard but not worked: W1MGX, GI3JIM, SV0VW, 9J2AS, XE1FFV, WA2SZP. Quite a while since the East Coast has been heard! Whilst on c.w. CR9AH, DL3JJ, HM5CO, JA1-3-6-9-0, W/K 4 and 6. The ones that got away: SP9RF, VS6FC. Thanks David.

From the QTH of Ken VK3TL: Africa is really coming through on 40 and 20. GB3RSS is the Scout station in England. Don has really been knocking them off from Cambodia and Vietnam. Ken reports working on 20 c.w.: CR6GO, EP2AS, HM1BB, HZ3TYQ, IT1AQ, OD5LX, VQ2DT, W9WNV/XU, PZ1AA, ZS3HT. 20 mx phone: CE3ZQ, CN8GB, CR6EI, EP2AU, EP2BQ, GB3RSS, HI8WSR, HM1AX, HP1MN, HS1I, OZ9Z, PJ2AA, ZS3HT, K7LMU/3W8, 5Z4AA. 40 mx: 5R8AB. Ken's best QSLs for the month: 3A2CP, 9M4JW, VQ4IQ, VS5LX, CR6GO, HR1RP, PY5ASN, PY3APH, HI8WSR, ZS3HT (S.W. Africa).

A late report from Ken on the air—he has heard that 28 Mc. has been open from PA0 to South America, also to South Africa to PA0 on occasions. From 2nd January, 1965, to 30th January, 1965, Ken will be operating from Norfolk Island under the call sign of VK9TL. Transmission on c.w. and s.s.b. will be forthcoming on 40 and 20 mx, and an eye kept on the 15 mx band and will be used if the band decides to show any life, which I think it will. Good hunting Ken, I hope to work you there. All QSL activity will come from his home QTH at Smiths Road, Templestowe, Vic. Thanks for dope, Ken.

From Pete VK5FM—some of the better ones worked: ON5ZO, 9M4LD, LZ1KPW, KC4USS, UR2KAA, G2BSA, G3LB, HC8FN (0630z), 4X4TP (LP), TI2SS, HK5AOH, PY3AHJ, LA-9CE, HC1SM, HS1S, Ws, Ks, etc., all on 14 Mc. s.s.b.

A letter from Colin VR4CB tells of a forced stay in VK4, a lapse in hospital, and an operation. However news is good. He will be making a tour southwards and calling here on 11th December. Will be nice to see you.

KG6SV is on from 0830z and puts in a good signal.

KX6AJ is now back in the States under his own call W6GRZ.

QTHs OF INTEREST

HZ3TYQ—Box 1721, Aramco, Dhahran.
W9WNV—Via K6EVR.
HP1MN—P.O. Box 5195, Panama City.
HI8WSR—P.O. Box 1287, Santo Domingo.
CR6GO—P. O. Box 10408, Launda, Angola.
CR6EI—P.O. Box 74, Benguela, Angola.
HM1AX—Via WB6GVV.
K7LMU/3W8—Via K6EVR (check elsewhere, this page).
VQ8R—Archie Parkhouse, P.O. Box 99, Mbabane, Swaziland.

Stan KX6BK is making the journey south to VK9 for the moment and hopes to visit the mainland a little later on.

A few of the W stations have only a few countries to go to have worked the lot. A rumour says that operation from these last remaining countries may be forthcoming soon as at present there is little or no activity from these remaining countries.

A parting word of thanks to those that sent in any notes this month. To the following names and call signs it is a pleasure to do business with them: Ken 3TL, Al 4SS, David 3QV, John 5LV. 73, Bert VK5BB.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK5MS	24	306	VK2JZ	61	217
VK6RU	2	303	VK6KW	4	211
VK5AB	45	301	VK3WL	14	211
VK6MK	43	293	VK3ATN	26	204
VK3AHO	51	289	VK4HR	12	192
VK4FJ	21	280	VK4RW	23	186

C.W.

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK3KB	10	326	VK6RU	18	260
VK3CX	26	304	VK3AHQ	79	248
VK2QL	5	301	VK3ARX	66	242
VK4FJ	29	296	VK3XB	75	238
VK3NC	19	286	VK3YL	39	237
VK2AGH	71	267	VK2EO	2	234

OPEN

Call	Cer. No.	C'ntries	Call	Cer. No.	C'ntries
VK6RU	8	309	VK3NC	77	287
VK4FJ	32	305	VK3HG	3	274
VK2ACX	6	300	VK3JA	43	252
VK2AGH	83	300	VK7LZ	23	242
VK6MK	74	295	VK2VN	18	235
VK3AHO	76	294	VK4HR	7	233

V H F

52 - 144 - 420 - 576 - 1296 Mc.

Sub-Editor: LEN POYNTER, VK3ZGP,
14 Esther Court, Fawkner, N.15, Victoria
ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

I would like to take this opportunity of thanking all those who have contributed to the support of this page each month and trust that they will continue on with the good work in 1965. Our correspondent in VK5 has been missing for quite a few months. We hope that having taken out his "Full" certificate he isn't lost to our ranks. Our usual full cover is missing without the VK5 notes, so hope someone will step into the breach and keep it up to date with the VK5 activity.

As can be seen in the VK4 notes, Channel 0 No. 2 is under way and by next winter our VK4 friends will be experiencing some of the problems that the VK3 boys have had for the past few months. George 4ZLG in Melbourne at the time of writing, will no doubt take a mental picture of the problems and also quite a few of the cures back with him. Geo. has seen some of our net activity and we hope was suitably impressed.

With these few words, I pass on to each and everyone all the best of health, happiness and DX for Christmas and for the coming year of 1965. Although there will be no notes in the February issue, keep the reports coming in. 73, best of DX, 3ZGP. (P.S.—If in Melbourne over Christmas ring 35-8577 for six-penny-worth.)

NEW SOUTH WALES

52 Mc.: Activity is increasing rapidly as more stations move to this band for the DX season.

144 Mc.: Activity good with several new stations on the band.

432 Mc.: A few stations active. 2ZCF relays the v.h.f. news broadcast on 432 Mc.

VK2 Beacon: A 2 metre beacon in the form of ABWN-5A is in operation. Sound is on 143.75 Mc. The station is located 12 miles south of Wollongong at 2,000 feet.

2WI is once again on the 52 Mc. band, with a frequency of 53.266 and output of 40 watts.

David 2ZXW and Phil 2ZPI will be operating from Mt. Kosciusko from early morning on Friday, 1st January, to Sunday, 3rd January. They will be on 144.045 and 52 Mc. Stations wishing to contact them should not operate in the first 200 kc. of 2 metre due to local interference. Best time for DX appears to be around 6 a.m.

A new type of event known as a Twilight Fox Hunt is being tried. This event consists of two fox hunts starting late afternoon, separated by a barbecue tea. This should allow persons unable to attend a full day or night event to participate.

Canberra News (from John 1ZRX): Only three stations active on v.h.f. They are 1CR, 1VP and 1ZRX. 1VP has 90w. on 52 and 144 Mc. and a 4/20 final on 432 and 144 s.s.b. Aerials consist of a 32 el. on 144, 4 el. on 52, and a 432 beam is under construction. 1ZRX is on 52 and 144 Mc. with a 3 el. beam on 52. All three active stations have gear for Oscar 3.

North Coast: Little news, stations active are: From Grafton—2WQ, 2OE, 2NY and 2TV; Bellingen 2ZCQ, Lismore 2ZFS and 2KA. They are all near the lower edge of 144 Mc.

V.h.f. Field Day. This will be held during March with many v.h.f. events. 73, 2ZPI.

VICTORIA

Band News: 6 metres has been very active over the past month. There are about 40 active stations on the 53.032 Mc. net. Two metres has been active, but has slowed down due to examinations which started at the beginning of November. There was a brief opening to Mt. Gambier at the end of October. 432 Mc. is still active and more stations are appearing on this band each week. John 3ZOQ reported that he heard the VK5 6 mx beacon on Monday, 12th Oct. at 3.30 p.m. E.A.S.T. Cyril 3ZCK heard a weak carrier on 53.00 Mc. at 5 p.m. the same day. This signal peaked to the west. Dave 3ZOD at Hamilton is active on 2 mx on 144.65 or 144.39 each evening and listens for Melbourne and Mt. Gambier stations.

VK3 V.h.f. Convention: The VK3 Division's V.h.f. Group held its first annual Convention on 11th and 12th Oct. at Ferny Creek in the Dandenongs. About 50 Amateurs from VK2, VK3 and VK5 attended, together with some 8 or 9 S.w.l's and many YLs and XYLs complete with harmonics. The Convention started with an eyeball QSO on Saturday afternoon, followed by a barbecue tea where many chops and sausages were cooked?? or eaten?? complete with ashes and cinders. After tea everybody adjourned to GTV9's tx station at Mt. Dandenong where the engineers on duty gave a very interesting talk on the operation of the station.

On the Sunday many more people attended and great fun was had by all. Events included a 2 mx scramble (won by 3ZNC), 3ZGF sold some disposals gear, and a hidden tx hunt. What a hunt? A Melbourne station was running the full gallon on the same frequency and was stronger than the hidden tx. No wonder, it was buried 6 feet down, half way up a 30 ft. cliff! with about a mile of coax connecting it to the antenna, which was at the top of a tall tree. It was eventually found by a VK5, ably assisted by 3ZNC, who was using a portable t.v. set on channel 5A as a snooper. After this everybody returned to Ferny Creek for afternoon tea, supplied by the ladies. Then all said their farewells and departed for home with ideas for making our next Convention bigger and better than the first.

V.h.f. Field Days: The VK3 Division's v.h.f. field day season commenced on Sunday, 25th October and will continue through until March 1965. The dates are as follows: Nov. 15, Dec. 20, Jan. 17, Feb. to coincide with the National Field Day, and Mar. 21. Except for Feb., the times are 1100-1700 hrs. E.A.S.T. Feb. will be the same hours as the N.F.D.

The following rules will apply. One contact per band per day. No arranging of schedules or contacts from band to band. No crossband contacts. Independent of S.E.C. or private mains supply (portable motor generator/alternator sets allowed). The portable location must be more than 1 mile from the home QTH. Operation must be within the terms of the Amateur licence.

Scoring will consist of: Home to home, 1 point per mile; home to portable, 2 points per mile; portable to portable, 2 points per mile.

A special bonus of 3 points per mile for each mile from the home QTH, provided that 1 station is worked from the portable location. The bonus can only be claimed once per field day and can only be claimed for one location. That is, you go 90 miles to a portable location, then over and above the mileage score an extra 270 points can be claimed provided one contact is made.

A certificate will be awarded to the winner of each individual field day. If a person wins more than once, the certificate will be endorsed for each subsequent win.

Scores must be submitted to the Publicity Officer by the second Thursday following the field day for consideration. All that is necessary is the points score to reach 3ZCK by the time mentioned.

Well everybody, I would like to wish you all the Compliments of the coming Festive Season and a very prosperous New Year with plenty of DX. I will be around every day on 144.42, 144.5, 53.032, 53.4, and 53.72 between 20th Dec. and 30th Jan. Good luck and best wishes for the Ross Hull Contest. 73, 3ZCK.

QUEENSLAND

During October two notable events took place. Firstly, there was the annual Scout Jamboree-on-the-Air and, secondly, there was Brisbane's first "mobile night". V.h.f.-wise, the Jamboree was a tremendous success. There were quite a number of stations who did not have Scouts with them, but it was these stations that made the week-end the success that it deserved to be.

Bob 4ZRC had a hectic time at Mt. Cotton where at one stage he had 85 Scouts camped around him. There was so much radio activity down Sandgate way that the local Scout group held a barbecue without a fire! You have all heard of r.f. dielectric heating and Tom 4ZAL now knows the meaning of "ground loss factor". Royce 4ZRH and Roy 4ZRM both had Scouts in to see and work all the switches and dials. Ron 4ZRJ and David 4ZDF operated portable from Scout dens. Grahame 4ZGN provided a station at Scout Headquarters, but on Sunday 18th it was operated by Peter 4ZPG. Mick 4ZAA was operating very low in the band that week-end. However, his frequency was definitely above 3.5 Mc.

The first Brisbane mobile night was held on 14th Oct. Six mobiles took part. The start was at 7.30 p.m. at Riverview Tce. and the night finished at about 10.30. I don't know whether this night was unique, but the idea was that each mobile would take a turn at hiding. The others could then ask him questions, the answers to which could only be yes or no. By this means the hidden mobile could be found. This type of activity has three advantages. Everyone has a turn at hiding in the one night. No directional aerials or special receivers are needed as for tx hunts and finally the YLs can do the operating while the Amateur drives the car or . . . Malcolm 4ZEL, chief organiser for the night, burnt out his change-over relay but completed the evening with a piece of wire from the tx out the window. With more than 30 watts in one end of the said piece of wire, something was bound to come out the other end!

Here in brief is an account of what the boys have been up to in the last months. Des 4ZJR has been working too hard lately with very little time left to spend in the shack. Bill 4ZBD cannot get his v.f.o. to operate his tx. Likewise, Frank 4ZAS is having the same troubles. Henry 4HC is back on both 6 and 2 mx. Les 4EH usually is around at 4.30 p.m. on 6 mx looking for mobiles. Peter 4ZCS has been heard occasionally during his lunch-hour or should it be lunch-half-hour? Jim 4ZJF must be hanging fire every week-end now and it is time that Dane 4ZAX stuck the whip back on to the mobile.

Walter 4ZPW is thinking seriously of 6 mx after his exams. He has worked three stations in as many months on 2 mx and is getting tired of calling. Bert 4CP is pumping out the watts on 144 megs, using an 829B, and Phil 4ZEP has had to be a little careful on how hard he drives his final. David 4ZDF has suddenly put covers on his rig and Alan 4ZLM is at present making two beams from the three he has.

Victor 4ZBT is still way up the band where no one looks and Lawrence 4ZLL has been mobile around Mt. Cootha rather frequently. Bob 4ZRC has a converted channel zero beam for his mobile which is very handy. Roy 4ZRM is receiving signals through an S9 noise level and has been talking about video. Royce 4ZRH is usually around on Sunday mornings after the W.I.A. news, as is Tom 4ZAL. David 4ZEK will soon be sounding like a duck if the transistors work and John 4ZJB was back on the bands for the Scouts.

Jim 4ZRA is using a log periodic but is having trouble with noise. Brian 4VR and John 4ZWB are still having regular contacts every Sunday night at 1900 on 144 Mc. Bill 4WD has moved to a choice v.h.f. location in Ipswich and Wayne 4ZBN can expect some QRM in the near future. Dave 4ZJH using battery power from Lake Manchester, is putting fine signals into Brisbane. Noel 4ZNJ and Malcolm 4ZEL have been mobile quite often round the town. Angus 4ZIC was the answer man when the Ipswich Radio Club visited the Amberley R.A.A.F. base.

No sounds to report from Laurie 4ZBL or Ross 4ZRD. John 4ZAV has his antenna back where it should be and Ken 4ZKP has found out the advantages of a v.f.o. Bruce 4ZCM is going strong on 144 Mc., as is Mick 4ZAA. Grahame 4ZGN supplied the official station at Scout Headquarters for the Jamboree. George 4ZLG has refused to connect up the wires from his beam rotator as the exercise of running out of the shack and climbing the tower is good for him.

Vince 4VJ has been on 6 mx consistently and Paul 4UL has made his first transmission on 52 Mc. He was one of the 5 mx gang in days gone by. Laurie 4ZGL is busy looking after W.I.C.E.N. here in Queensland. Ron 4ZRJ has made a re-appearance on the bands and is thinking of converting his motor scooter mobile to transistor operation. Finally, I believe there is a 6 mx hook-up each Sunday morning prior to the W.I.A. news in the Bundaberg district.

Channel Zero has begun transmitter construction here in Brisbane. The site is about 500 yards from my QTH and as Dane 4ZAX says, although the upper sideband will be 50 db. down, I will still get about a megawatt of signal from the station!

The Christmas Season is just about with us, so I should like to take this opportunity on behalf of newshound Tom 4ZAL and myself to wish everyone the Compliments of the Season. 73, Peter 4ZPL.

(Continued on Page 26)

S W L

Sub-Editor: Chas. Aberneathy, WIA-L2211
30 Urunga Parade, Miranda, N.S.W.

With yet another year drawing to a close, we find that during the past months, increased interest in our hobby was revived in all States. We lost a few contributors to our page, but we gained overall. It is surprising the number of non-members who read our page and by answering their mail in the normal way, we have gained a number of new members.

In all walks of life, nothing is gained unless one is prepared to work to achieve that which one seeks. QSLing is no exception, so if you want returns, spend time on your report, and make it of some value to the person concerned. When sending reports, you must include the call sign of the station heard, date, time G.M.T., frequency, QRN, QRM, QSB (if any), readability, signal strength, weather, mode of transmission, your type of receiver, antenna height and direction of same, plus portion of the QSO as confirmation. Reports to overseas Commonwealth countries enclose a Commonwealth reply coupon, to other countries an International reply coupon, whilst in Australia a stamped addressed envelope may assist in getting you a card in return. The above coupons are available at all post offices.

SENSITIVITY

The sensitivity of any receiver is the amount of r.f. input voltage needed to produce a specified amount of audio output power. It would seem that any amount of sensitivity could easily be obtained by adding more r.f. amplifier stages. But this is not so, because of the presence of noise. Noise Is any undesired electrical disturbance within the desired frequency band. Noise is already picked up by the antenna in the form of atmospheric disturbances, called static, and man-made electrical interference, produced by a variety of electrical devices. External and internal noises are amplified by all the stages of the receiver along with the desired signal and eventually tend to drown out and mask the signal.

It is evident, therefore, that the usable sensitivity of a receiver is not determined by the absolute value of the signal strength at the receiver input, nor by the number of stages of amplification, but rather by the ratio of the signal strength to all noise present at the input of the receiver. It is this signal to noise ratio at the input of the receiver, therefore, that limits its maximum usable sensitivity.

Little can be done to improve the signal to noise ratio for a given receiver circuit or system of modulation. There is, obviously, no point in amplifying the signal with the noise beyond the point where the noise itself becomes objectionable, since this will only make the signal, plus noise, louder but not more intelligible. However, since noise is more or less uniformly distributed over the entire frequency, the noise pick-up can be reduced by limiting the bandwidth and hence audio fidelity passed by the receiver. In communication type receivers, where audio quality is of secondary importance, the bandwidth is generally cut down to the bare minimum for acceptable intelligibility. It now becomes evident, why frequency modulation, which does not respond to amplitude noises, is such a boon compared with a.m. reception. The signal to noise ratio and; hence, usable sensitivity of f.m. receivers is far greater than that of a.m. receivers.

NEW SOUTH WALES

At a recent meeting of the VK2 S.w.l. Group application was made for membership by two young lads, who live at Wodonga, which Is situated just over the border in VK3. These lads are members of the Albury Radio Club, where they claim to do their listening. The matter of acceptance was discussed at length by our committee, and finally we sought judgment from the VK2 Council, whose decision was that they must join the VK3 S.w.l. Group. Mention was made re the L2/VK4 numbers, and it was found that these were allocated some time ago as there was, and still is, no S.w.l. Group in VK4. We lost two members, but trust that L3 will gain, and so increase membership generally.

A welcome to our Group goes to John Laidlaw, L2013, and ex-L3, Mac Hilliard, who is now L2074.

Ray L2287, during October, logged on 14 Mc. some 50 countries, which is quite a good effort. Ray was using an AR7 rx. Mac L2074 has received QSLs from OK3AL, 5N2JKO, SP3KCC, KP4CL and UM8KAA. He reports good conditions to W land on 21 Mc. during October, with nil on 28 Mc.

Henry L2271 is busy trying to get going on the v.h.f. bands and tells of an S.w.l. Group in Ipswich in VK4. I would be interested to hear more about it OM if you can manage to get some details.

Bruce L2283, welcome to our page OM. Do not be disappointed re QSL cards as they can quite often be a long time in arriving.

VICTORIA

The VK3 S.w.l. Group conduct a radio construction night on the second Friday and a general meeting on the last Friday of each month. During the past few months the Group visited the VW factory and ABV2 television studios, both visits being of immense interest to all who were fortunate to be present.

There was some arm twisting at the Sept. meeting, when the annual election took place and resulted in the following being elected: President, Harry Roach; Vice-Presidents, Geoff Perrin and Maurice Cox; Secretary, Ian Woodman; and broadcast correspondent, Brian Hannan. Members are reminded that the Group hopes to arrange a Christmas Party on 18th December, and to visit GTV9 studio in the near future, so attend meetings and listen to 3WI news broadcast for further details.—Ian L3006.

Eric L3042's rarer type QSLs received during October: AP2AR, MP4QFB, UD6BV, VR3E, VU2ANI, 5Z4AQ, UI8LB, UO5SD, 5WS, VQ8AM, LA2PH/MM, YO4WR/MM. After four years of "never give up trying," Eric managed to get his Andaman and Nicobar Islands QSL, VU2ANI. It came direct from one of the operators of the DX-pedition concerned. So never say die, keep pressing on ever hoping that one day the desired QSL will turn up.

Greg L3138: Congrats on getting the required for the Jo-Burg award, another one for the wall, hi. QSLs to hand during the month: XW8AU, JA5AHF, JA3AJF and W7GX. with one new country heard: UW9CC. All the best with your exams.

Noel L3101: I trust that you had an enjoyable holiday. Nice going with those four new countries heard, you are getting close to me on that ladder OM. I hope to meet you when I am in VK3 in January.

Peter Curran: I do hope that by now you have received your L3 number and that your busy period on the farm is over. Pleased that you liked Bob's article on transistors.

Drew Diamond: That is quite an impressive list of DX OM. By the description of your rx you are doing very well. I wish you success with your exams.

SOUTH AUSTRALIA

Alan L5085: That score of yours in the VK-ZL Contest was really a good effort and I feel sure that you may be at the top in L5. Congrats on getting the necessary for the Jo-Burg Award. Heard recently: EP2, HS1, PA0. AP4, HI8, CN8, and OH1. QSLs to hand: VR1B, JA0AFP, VE6ABP and ZL1ABZ. Good luck with your exams.

Tim L5067: Many thanks for the circuit of the crystal filter. We may use it at a later date. I trust that you are feeling better after your fall. You want to pick something softer than concrete next time. By the way, did you go round in better than 104? Stations heard: DU1, ZK1, OA4, FR7, VR1, KH8, YV4 and KG6.

WESTERN AUSTRALIA

Peter L6021: Many thanks for your information re awards, but it shall be a little while yet before I shall be able to compile the article. What's this 1 a.m., and 2:30 a.m. till 6 a.m.? When do you sleep? Still, if you want results, you have to work for them, and you are sure getting just that! OK on your big score in the VK-ZL Contest. I do hope that it gives you another award. Quite a different tale in the VU2/4S7, still who knows? Latest cards to hand: ZD3, VP7, KM8, HA6, OK, UA.

Bryan L6028: Welcome to our page, Bryan. It is pleasing to know that another L6 has joined us and we trust that you shall continue to put pen to paper each month. Bryan uses a Murphy 160 rx with a long wire antenna, and his recent loggings are: FR7, KR6, HK4, OA4, YV4, DU8, FB8, 4S7, 9M4, ZS1.

Could anyone tell me the whereabouts of a chap who uses the number VK2-10181 as I have quite a few cards for him?

Thanks to all those members for writing during the year, your assistance has been most helpful in keeping our page intact.

Wishing all Shortwave Listeners and Amateurs all the best for Xmas and the New Year, and hope those long awaited QSL cards come alive in '85. 73, Chas L2211.

S.W.L. DX LADDER

	Countries Conf.	Countries Hrd.	Zones Conf.	W States
E. Trebilcock	285	293	40	50
P. Drew	141	243	34	30
D. Grantley	124	281	38	35
A. Westcott	97	159	31	11
M. Hilliard	91	241	33	14
M. Cox	84	232	30	21
G. Earl	78	151	32	10
C.Aberneathy ..	64	104	33	14
N. Harrison	56	176	31	37
L. James	51	144	24	10
I. Thomas	42	139	20	14
A. Raftery	29	132	15	8
R. Beckley	27	50	19	—
R. Oats	9	26	8	—

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VHF NOTES

(Continued from Page 25)

WESTERN AUSTRALIA

The last fox must have been having cubs, because it was on the limit of the metropolitan road maps. A 9-watt signal into a 5 over 5, 30 ft. high on a small hill, it put in a 5 and 9 signal 20 miles away at the starting point. There might as well have been a river in the way for there was no easy way to it and only two hounds found it—6LR and 6ZDB. Wanted: Ham not participating to relay bearings to hounds in trouble.

At the last meeting on 28th Oct., main business was the Xmas Party and the type of liquid refreshment. The wowsers were finally subdued, although their argument that doping of the hounds would be hard on the fox had some merit. 6LR is going to be busy as he is organising the Xmas Party and the National Field Day. It will give him something better to do than rewinding genemotors to work as alternators.

The f.m. mobile sets are a delight to use. I sometimes wonder how many taxi drivers went mad listening to noisy old a.m. For those country members interested, some a.m. sets using 6J8 in the final are available. Please write to Mr. H. Pride, 26 Lockhart St., Como, who is conducting the ballot. Price should be around £5/10/0. Rumour has it that some 12-watt f.m. sets. will be available soon, but nothing definite. The a.m. sets available need some conversion work done on them like crystals and variable tuning. 73, 6ZAG.

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Publications Committee Reports That . . .

All mail received at P.O. Box 38 up to the evening of 9th November has been printed in this issue of "A.R.," with the exception of technical articles contributed by VKs 3EM, 4SS, 2AKB, 3SK, W1DFS and R. W. Humphreys.

The question of the colour for the front cover of the 1965 issues of "A.R." was resolved and a "greclan blue" was chosen.

The result of a meeting with F.E. regarding the "Call Book" was reported upon and the delays in publication were explained. It is anticipated that the new issue will be available mid December, but it may be delayed in posting by the Christmas peak mailing period, hence all readers should not be disappointed if it is not available in their State until mid January, as it has to go second class mail.

The increase in cost for "A.R." having been ratified by the Divisions, will enable your Committee to add new features as from 1st March, 1965. Fuller details will be announced in the next issue.

With the close of this year it is fitting that your Committee thanks you for the manner in which you have assisted in maintaining your magazine. It is difficult for all to help, but we are truly grateful for the manner in which all contributors have been able to maintain continuity of notes and reports, etc. It is our sincere wish that with the coming Christmas period, you and yours enjoy all that is good.

Notes for the January 1965 edition of "A.R." closed on 1st December, and it should be remembered that due to Christmas shut-down at our printers, that the February 1965 issue of "A.R." will not contain any notes or reports. The February issue will contain only technical articles. Standard layout will resume with the March issue of "A.R."

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

I.T.U. FUND

As agreed at the last two Federal Conventions, Divisions were given target figures to meet towards financing representation at forthcoming I.T.U. Conferences. To date, the percentage of the target figures met are shown by States:—

VK2 —
VK3 25%
VK4 47%
VK5 32%
VK6 75%
VK7 50%

The above figures represent monies received by Federal Executive and not necessarily monies still held by Divisions.

AFRICAN I.T.U. CONFERENCE

In the middle of October a special conference, convened by the I.T.U. aimed at drawing up a medium broadcast plan for Africa, attempted to exclude Portugal and South Africa from the proceedings. Both these countries claimed the decision was illegal and refused to leave the hall following a vote to exclude them. Other African and Arab delegates walked out of the Conference. Western countries endorsing South Africa's and Portugal's stand were Britain, France, Belgium, Luxembourg, Italy and the Netherlands. The I.T.U. Secretariat also supported the example of the West and without the agenda being discussed, the Conference ended a week earlier than expected.

ILLNESS OF FEDERAL SECRETARY

Mr. Jay Lancaster, VK3JL, the Federal Secretary, has had a serious bout of pneumonia and has spent the last few weeks in bed. As a result, some outstanding correspondence has not been answered. These matters are being dealt with now, so please bear with us a little longer if you are awaiting an answer to your letter. The illness of the Secretary is the culmination of a series of minor troubles and it is likely that following medical advice that he will need to take things a lot easier in the future. We all wish Jay a speedier recovery and return to good health once more.

NEW MEMBERSHIP CERTIFICATES

A new membership certificate has been prepared and already small quantities have been issued to some Divisions. As soon as possible, quantities will be forwarded progressively to all Divisions, as the signing and sealing is no small task.

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FEDERAL QSL BUREAU

Bruno Bossert, HB9QO, who has been working in VK2 and VK3 during 1964, returned to Europe by sea in November. Bruno was engaged in the installation of remote control power switching equipment associated with Snowy River Hydro-Electric scheme. He will arrive in HB just in time to assist his family to move from Nottwil to Brunnen. Bruno visited VK2, 3, 4, 5 and 7 during his stay in Australia.

Len Smith, VK4TE, currently on Willis Island, is active on 14100 kc. c.w. and s.s.b., mainly at week-ends. He is not presently interested in QSLs, but may reconsider when he returns to his home QTH in June 1965.

The Long Island (U.S.A.) DX Association is sponsoring an annual marathon DX Contest. Details of this marathon contest appeared in November "A.R." (page 8) and further information may be had from this Bureau.

Details of the following newly announced Manager; Colombia 6N1 Award; Angola Z36A awards may be had from the Federal QSL Award; Spain, Annee Sainte de Compostelle Award; Australia Down Under Award. Writer also has a current issue of the C.H.C. Directory of Certificates and will be pleased to supply any award info for s.a.s.e.

Ken Matchett, VK3TL, has completed all arrangements for his one-man DX-pedition to Norfolk Island. The operation will cover the whole of January 1965 and Ken has been issued with the call sign VK0TL. Ken will use s.s.b. and c.w. on 7, 14 and 21 Mc. bands. All QSLs should be sent to VK3TL either direct or via Federal Bureau. Ken's home QTH is Smiths Road, Templestowe, Vic., and he stresses that on NO account should cards be sent to Norfolk Island.

Writer wishes all readers and Divisional Bureau Managers the best wishes for Xmas and 1965 and the hope that the forthcoming year will produce higher QSL totals, after a very lean 1964.

—Ray Jones, VK3RJ, Manager.

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NEW SOUTH WALES

HUNTER BRANCH

The November meeting of the Hunter Branch was held at the Tech. College, Tighes Hill, on Friday, 6th November. The guest lecturer for the evening was Col. H. J. Trick, of the Military Products Division of A.W.A., who spoke on Microminiaturisation and Military Equipment. The best attendance for some time, 50 members, associates and visitors were present to hear a most informative lecture, delivered in a professional manner. One of the rather startling facts which Col. Trick told the gathering was that a certain new bomber uses one million transistors in the guidance and electronics system. I am wondering what Bill 2ZL would have to say about a service job on one of these. Many of the boys are having second thoughts about the abilities of computers after listening to some of the rather strange stories told by the Colonel. The other colonel, Cox, Frank 2APO, moved a vote of thanks to the lecturer and this was carried by acclamation. Whatever you do, don't fail to be at the next meeting to be held on 4th December—but more of this later.

Since the field day several members have had quite a deal of publicity in the local scandal sheets. One such was President Frank who had a poem written about him having a certain small out-house on the front lawn outside his Merewether home. Being clean-up day, the City Council had threatened to take it away and Frank had to commission some unsuspecting lady friend to write an ode to the dustman. It was all very humourous and the publicity was even funnier when we knew it was Frank.

Mac 2ZMO is having much the same sort of strife in an attempted duplication of facilities at his shack. I am told from a most reliable source that he spent several hours the other day taking a bearing on an interloper in the two metre band only to find that it was generated within his own rig. Since then the red face department has another supporter.

Up in the coal city of Cessnock, now known as the r.f. centre, Sherwood, of sidecutters fame, is known to be contemplating taking unto himself a reliable cook since he found the water inflammable when boiled at the old residence. It is even said that he is on the air, but I believe this to be just another nasty rumour.

The 160 metre adherents are having a field day and I know of four top-band transmitters just waiting for the power to be switched on to be active. One of these fortunate people is none other than Stan the QSL man, or 2AYF to you others. Jan 2BJO, having had some practice at sending dah di di di dah for several hours, has now graduated to a bug, so goodness knows what will happen. His top band transmitter is going like a charm and according to his off-beat calculations the efficiency is 125 per centi There's one for Mr. Euclid. Lionel 2CS has returned from his jaunt down the South West reporting to all that he heard the Monday night broadcast on a transistor portable. Perhaps it was one of the good ones. Gordon 2ZSG now has the staircase in the new shack and has thrown away the jacobs ladder and taken his wife off full time duty on the winch.

It's really much easier now, Bill 2CW is reported to be making a comeback and may soon be heard on 80. Warren, his son, seems to be the driving force and Bill finds it easier to get the rig going than make excuses. The boys from the Westlakes Radio Club had a most informative night out last month when 13 of them visited the transmitting station of the National Broadcasting Service and saw 2NC/2NA on the air. Mad Mick of course just happened to be in the transmitter cabinet of the spare unit when someone put the blower fan on and almost caused him to turn grey within seconds. Over keen we call him—to his face.

OBITUARY

JIM CORBIN, M.B.E. (VK2YC)

The N.S.W. Division and the W.I.A. suffered a severe loss with the death on 29th August of James B. Corbin, M.B.E. (VK2YC).

The name of Jim Corbin and the call sign VK2YC were prominent in the life of the W.I.A. and on the Amateur bands for more than 30 years.

As a member of the W.I.A., Jim was an Associate on joining in 1928, a Full Member on obtaining his Amateur Experimental Licence in 1932, and an Honorary Life Member in 1951.

Throughout the DX world, VK2YC was well known, especially when the 28 Mc. band was open. The 28 Mc. band was Jim's favoured DX band and many DX operators shared his reminiscences of the ten metre DX of pre-war years.

From 1932 until 1957, Jim was QSL Officer for the N.S.W. Division and in this capacity was also well known wherever QSL cards circulated.

First elected to the N.S.W. Divisional Council in 1937, Jim served the Division again in 1947-48, from 1950 to 1952, from 1953 to 1958 and again, despite ill-health, in 1964. During these periods he was Divisional President in 1950/51 and from 1953 to 1958.

In 1935 Jim was appointed N.S.W. representative of the R.S.G.B. and the B.E.R.U. During several terms as N.S.W. Federal Councillor, he represented the Division at Federal Conventions and in 1963 and 1964 was Official Observer in Sydney and Adelaide.

Members will remember the feature "Slouch Hats and Forage Caps," dealing with the activities of Amateurs in the Armed Forces, which Jim wrote for "Amateur Radio" during World War II.

Jim's pharmacy at Eastlakes became the control station as VK2WI/VK2YC for the Divisional Emergency Network on a number of occasions between 1954 and 1956 and for his work during the disastrous floods in Feb./Mar. 1955, Jim was honoured by the award of the M.B.E. This award he always insisted was "The Institute's M.B.E."

Feeling the need for an official emergency station, Jim aroused the enthusiasm of his Division to buy land and erect a fine building at Dural, about 24 miles from Sydney, as a "Home for VK2WI" and as a memorial to his fellow Amateurs who had served the community during emergencies. It is from here that the N.S.W. Divisional broadcast takes place.

Jim's work for the Institute was untiring. During his terms as President, he devoted himself selflessly to Institute affairs, visited country centres to make contact with local Amateurs, urging them to W.I.A. membership, and attended Conventions throughout N.S.W. and in adjoining States. Visitors were always welcome to his home and his hospitality was extended to all. Never strong physically in recent years, he was to be seen almost every week-end working in the grounds and garden of the Divisional station.

The N.S.W. Division owes a debt of gratitude to Jim's widow, Ruth, his four sons and daughter for their service to the W.I.A. over many years. To them we express our sincere thanks and our deepest sympathy.

More than twenty-five Amateurs attended the funeral on 2nd September and as a final tribute to their former colleague, the casket was carried to the graveside by four Past-Presidents of the N.S.W. Division—VK2EO, VK2HZ, VK2VN and VK2YB.

Belmont Bob is doing the right thing and has a morse class going at his place of residence. The boys are making good progress and can copy Bob's sending—which is more than some of us used to be able to do. Do you remember Sig. Blyth? I do. Max has been burning some midnight fuel at the clubrooms and now has the complete morse set-up in for the A.O.C.P. class. This has ten positions and enables the operator to talk to any of the students individually or collectively and for them to practice in any group size they wish. This means that the club boys are going on apace with the morse and some are to try for the January exam.

Len 2ZFD reported the other night that he is almost ready to roll on 432 Mc. and Des 2ZDN is still having the same success with the miniature 2 and 6 metre rigs. So much so that he almost blew Mr. ZKW's speaker out the other day when passing by on a service call. Up in the blue grass country, round Singleton, the grass has been scorched by the latest U.S.S.R. satellite putting out positively blistering signals into Geoff's receiver. Geoff said it was the loudest and broadest v.h.f. signal he's heard. Which reminds me, we haven't heard from the Oriental Jaunter for a month or three and it has come to my ears that the lecture for the December meeting is to be given by Australia's most disappointed athlete. He didn't get a gold medal. But he did make some pretty pictures, so what about coming along to see them. The meeting place has changed for just this once and will be in the dining room of the Prince of Wales Hotel, Merewether. Bring some few shillings with you, as we're having a buffet type supper. It starts at 8 p.m. on 4th December. If I don't see you, have a Happy Christmas and I'll see you when you're older. 73, 2AKX.

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QUEENSLAND

NOTES FROM DIVISIONAL COUNCIL

The October Council meeting was held at the Rooms of the Social Services Institute at Berwick St., Fortitude Valley at 8 p.m. on Thursday, 1st October. Nine members of Council were present. In the absence of Peter 4PJ, Vice-President Lionel 4NS took the chair. The minutes for the previous meeting were read and adopted. Instructions were issued to proceed with the purchase of a crystal to allow 4WI to operate on 6 metres. This crystal should soon be to hand. Such a statement was made back in July, but it is hoped that the crystal will appear this time.

A quarterly report on Youth Radio activities in the State was tabled by Charlie 4UC. Paul (disposals officer) reports the coming to hand of a fair quantity of gear, so watch "QTC" for the bargains. Taxi transceivers were still in short supply at the beginning of November, but orders will be taken and filled as soon as possible.

OCTOBER GENERAL MEETING

The monthly meeting was held on Friday, 23rd at 8 p.m. It was well attended and an estimate of the number present was given as 60 members. After the minutes of the previous meeting were read, the names of new members for the month were presented to the meeting and accepted.

Claude 4UX took the floor and talked on "Broadcasting Stations and Their Equipment". The lecture was spiced with humourous descriptions of some of the memorable experiences he has had while working on National broadcast transmitters. Later a short discussion on "Seacom" as applied to the microwave link between Brisbane and Townsville, was held. Visitors to the meeting included Eric Nissen from Dalby (4QS) and Ed Pendleton (ex-WA6).

GENERAL NEWS

News of the month was the Picnic held at Victoria Point to honour two members of the Kingfisher group. George 4GG and Bill 4WS were the guests. The Kingfisher group were all complete with XYLs and harmonics. During a speech in reply, it was noticed that George did not include even one growl! It was very interesting to be amongst these Amateurs whose participation in Amateur Radio dates back many years. Newt 4QW made reference to the year 1902! George had with him a syllabus of exam. questions from the early days. How would you go if you were asked how many volts are necessary to make a spark jump ¼" across two needles? Further, next time you see Newt ask him about the regulations that applied in the early days.

Recently I spoke to two members of the Padua Youth Radio Club operating under the call sign 4PE. They told me quite confidently about their equipment, a Geloso v.f.o., reference shift modulator, 6146 final, 40 metre folded dipole and AR7 receiver. The boys were on 6 metres from the shack of Les 4EH. They had one comment which may be food for thought. Although they have had over fifty contacts so far, they have only received back ten QSL cards! I leave it in your hands.

On behalf of the VK4 Council, I wish all readers of this column all the best for a very happy Christmas and a prosperous New Year. 73, Bill 4ZBD.

TOWNSVILLE AND DISTRICT

Very sorry that I missed last month's notes, due to the fact that I was not feeling the best owing to my old complaint "bad back". Needless to say, this has left me, hence the few lines this time.

Owing to the fact that I am not hearing much on the bands, must be that I am losing my touch in not being able to pick the right times to listen. Witness the fact that Bert 4LB is working the Europeans around midnight, yet when I listen at this time on my suitable shift, it all seems dead or that the few are hardly audible. The other night was able to work Jim GI3JIM after many years since last QSO.

Charlie 4BQ has the 40 metre Quad going and certainly shows up on the skyline. Seems to be an added attraction to Townsville Centenary Year. Vern 4LK being honoured with a Dinner in appreciation of his long time with the Flying Doctor's Service. Certainly nothing is a trouble to him to help out in the time of need.

Not having met the boys in Townsville of late, am unable to give any news on what is happening. What with no local club, seems that all and sundry have tended to watch the one-eyed monster. Maybe when the sunspots get like the measles and DX returns once again, there will be a renewed outburst of energy to get things as they were in the days gone by.

As I will be in Melbourne on annual leave as these are being read and will miss out on the New Year notes, unless Bert 4LB fills in meantime, I wish each and everyone the Season's Greetings, with a fervent wish that the coming year will be on the up and up. 73, Bob 4RW.

SOUTH AUSTRALIA

The monthly general meeting for October of the VK5 Division was held as usual in the club rooms to a capacity gathering of members and visitors, and took the form of a jumble sale, ably conducted by that ace of auctioneers, Brian 5CA, assisted in no small manner by our worthy President and champion of s.s.b., Phil 5NN. Everything worth writing about these types of night have been written many times in the past and much as I regret not being able to pad a little at the expense of the night, I decline to do so. After all, I do have a conscience. True as true! Suffice to say, everybody present thoroughly enjoyed themselves, and a good time was had by all. No business was conducted, general or Federal, although the President did announce, with a warning glare in my direction, that if anybody did have any urgent business to discuss, now was the time to go ahead. Honestly, I was not game to stand up, I was quite bulled —I mean cowed.

It was announced at the meeting that the Federal Secretary, Jay 3JL, was still somewhat indisposed and all present expressed the hope that he would soon be restored to health. Hope by the time that you read this OM that you are in the pink again.

Leith 5LG is among the missing. Not at the meeting, not heard on 3.5 Mc., in fact a conspiracy of silence. Where are you OM? Don't tell me that I have scared you off. Also, where is the ex-Mayor of Lucindale? Can it be that the Semaphore shrimps have him in their clutches, or is it that the Largs Bay cockles have him in hand? Can it be that the Outer Harbour oysters occupy his attention Anyway, where are you Arch 5XK?

Gilbert 5GX strutting around the meeting with his chest out like a pouter pigeon. The reason? Well, it took a lot of getting out of him—he is modest like me—but he had worked a South American that afternoon on 7 Mc.—a somewhat unusual effort for VK5 if I might say so. What was the report from Peru, Gilbert?

Talking of unusual DX, I asked Ses 5GP if he was working anything much, and he said in a very condescending manner, "Only the usual Cubans, South Americans, Mexicans and Russians." How would they be? Only the usual—wouldn't it!!

Talking to Arthur 5HY, after he had finished trying to indoctrinate me again in the merits of s.s.b., I noticed a listener's report card from France addressed to him, stated that the listener was using a Maria Maloca aerial. For goodness sake, what next will they use for aerials? It's that s.s.b., that's what it is.

Comps 5EF was at the meeting and remained tight lipped in my presence, evidently determined to give nothing away. I complained to Les 5AX about this, and he bounced back at me, quick as a flash, and said, "You couldn't understand him if he did talk." Well, how is that, these Gawler boys must have had vinegar on a fork before they left for the big smoke!

A welcome visitor at the meeting was Arthur ZL3RE, over here on a short visit. It appears he met Les 5LC who told him about the meeting night. Nice to meet you OM. Also nice to know that you are on a.m. Down with s.s.b.!

Heard the two Jacks—5JS and 5LN—in QSO on 7 Mc. the other Sunday afternoon, and the comments from Jack 5JS on current happenings in the radio world made merry listening. Apparently he had been bargain hunting again, and was well pleased with his purchases.

Stuck around on the frequency at the end of the QSO and was well rewarded by hearing Athol 5LQ come up and call Jack 5LN and take him to task for not being on at sked time the previous day. Have been trying to locate these two for months, but they have been very elusive and decidedly canny in their remarks. A nice pair, these two, and definitely a handful for their respective XYLs. Distinctly heard Athol say, "You tell her that I kept you late, and I will say that you kept me late." How low can one get?

Also heard Howard 5XA and the Admiral 5VB in contact on 7 Mc. the next evening, and although they would only be a stone's throw from me as the crow flies, their signals were swinging about all over the place. Nice signal Vern, also nice to hear you once again Howard.

I never thought that I would live to see or hear the day that Carl 5SS would be on the air on 7 Mc. without being hooked up with Frank 5MZ. However, the impossible happened the other Monday evening when I listened to Carl and a couple of VK3s discussing high quality recordings. Waited patiently for the voice of Frank to come up, but nothing doing. I will have to look into this phenomenon.

Col 5HY must have some interested parties up Balaklava way as I am led to believe he was asking on 3.5 Mc. for some application for membership forms to be despatched to him. Good work, Col.

Bob 5RI, not heard here for quite a while, was also heard on 3.5 Mc. with his new Viking, and gave the information that he had been playing around with opening his gate, using a model aircraft type of transmitter, plus motors of course. Was intrigued to hear him say that the radiator grille of his Falcon resonated nicely at the frequency and made a nice aerial for the job. Unfortunately, the mixmaster in the kitchen managed to get into the act at times and opened the gate at the slightest provocation. Like Pete 5FM, he has also acquired a boat and is scaring all the fish in the locality.

Dud 2DQ apparently takes it for granted that every time he comes on the air that I am sure to be listening in. He never fails to include me in the QSO, disparaging remarks free for the asking, although why he should think that I would bother to listen to his duck talk beats me. Hope your bi-focals don't focus OM!

Ron 3OM advises via the grapevine that the VK3 Division have the same set-up in Morse tapes as the VK2 boys, but not for loan, only for copy. Send your tape along to him, ask nicely, and he will be pleased to dub your requirements. Apparently the VK5 notes are perused by more people than I thought.

I managed to find out the reason for not hearing Frank 5MZ lately. It appears that he was at a birthday party for Carl 5SS recently and at supper time Frank, like Oliver Twist, had the cheek to ask for a spoon to stir the coffee. When Carl's XYL (Jean) went to the drawer to get him a spoon, she was overcome to find that all the silverware had vanished. To draw a veil over the shocking scene, the silverware was found bulging from Frank's pockets and although rumour has it that he only got six months, I believe the judge said only his youth saved him. Naughty-naughty-Frank.

OBITUARY

NORMAN COLTMAN

The VK5 Division announces with sincere regret the sudden passing of Associate Member, Norman Coltman, on 16th October, 1964. For many years Norm was Associate Members' Representative on the VK5 Council and an active worker for the Division. He will be missed by all with whom he came in contact.

To his sorrowing widow (Gwen) and his two sons we extend our heartfelt sympathy in their sudden and sad loss.

I told John 5KX at the meeting that I was short of news for this month and could I send him away for his world tour earlier than next June. He said it was OK by him, but not to bring him back any earlier. Now what does that mean?

I notice that in the Electricity Trust of S.A's house magazine that there is a list of all the licensed Amateurs working for E.T.S.A., which leads me to ask does the W.I.A. support E.T.S.A., or does E.T.S.A. support the W.I.A.? Incidentally, five out of the nine Council members are with E.T.S.A.

Geoff 5ZCQ, our worthy Federal Councillor, is the scribe for the above-mentioned magazine, and if reports of his efforts are to be believed, the VK5 Division have a ready-made sub-editor for "A.R." magazine in their midst should I ever decide to throw in the towel. He tells me that his XYL now has her driving licence and warned me to keep off the roads. I would much rather resign from the job than be carried out OM!

As mentioned last month, the family castle has been in the process of being brought up to 17th century living conditions, and one of the carpenters on the job soon located my shack and was suitably impressed with the contents. It did not take long to wake up that he was another of that army of frustrated would-be Radio Amateurs who would have liked to be but never quite found the time or the opportunity. He had originally come from Poland, had a name that was a cross between a sneeze and a hiccup, and when he discovered a QSL card on my wall from his home country, in fact in the same street as he was born, we were buddies for life. I could not hope to pronounce his first name, so I settled for Bill, and naturally Bill twisted my arm enough to give him a running description of my shack and its contents. Now although I say it myself, my shack is well worth showing off, in fact the late Doc 5MD always said that it was the most technical looking shack in VK5, and the least used, but then he was always flattering me. To make a short story longer, what I am getting at is that I was quite prepared for Bill to go into raptures over my shack and the equipment on display, but our beautiful friendship came to a fast and short stop when the first thing Bill said as we entered the door of the shack was, and I quote, more in sorrow than anger, "Did it take you long to build up your s.s.b. equipment"!!! I learned later on from one of the painters, who fortunately had no interest in Radio—Amateur or Commercial—that the aforementioned Bill had a diploma in electronics from some university or other in Poland. S.s.b. indeed, we now curtly greet each other should I not see him first!

The news of the passing of Associate Member Norm Coltman came as something of a

shock to me and many others, especially as I had only alluded in the notes last month that I had met him and that he seemed definitely on the way up from his recent glandular trouble. Norm, for many years, was a keen and active worker for the Division, in fact he was the members' representative on Council for quite a time, was always well to the fore at the annual picnics, and could always be counted on for any active assistance in any Divisional chore. Keenly interested in 288 Mc., he spent most of his time on that band, but in recent months had somewhat deserted Amateur Radio for the Masonic Order. I came in contact with him, both professionally and as an Amateur, and he will be missed by many. So Mote It Be.

I notice that Bob 4RW, in his recent notes, inferred that I was not finding the going tough for news these days, and whether he pointed the bent banana at me or not as he said it, I will never know, but this month has been the worst month for news in VK5 that I have ever known in my long and unethical career as a newsgatherer. I threatened to make up my own news, libel suits or no libel suits. I warned that my supply of noughts would cease if my espionage section did not hoist up their socks. I even tried to squeeze some news from our worthy President, Phil 5NN, but all to no avail, and as a last resort I threatened to resign the job as sub-editor unless all the clams opened up. The cheers and sounds of rejoicing that greeted this threat quickly made me change my mind about this, and was probably the one spur that I needed to carry on. However, I must confess that my sense of imagination has been decidedly strained this month, in fact I am leaning a little way towards the theory often expressed by Ye Ed, that I have a slight tendency to pad these notes. Heaven forbid!

I have heard several chaps on the air asking where Roy 5AC is these days. Personally I have had no news of him for a long time, and knowing that he sometimes is guilty of perusing these notes, I suggest that he come out from under and give me something to write about. What about it Roy?

Understand that W.I.C.E.N. had an exercise one recent Sunday up in the mountains, v.h.f. and the square band together, and a mighty successful exercise it turned out to be. My informant, a definite s.s.b. addict, went out of his way to tell me that the 80 mx s.s.b. outfit excelled itself, and left me speechless, with his chest blown up like a pouter pigeon. What makes them think that I am so interested in s.s.b.? I hope all their fowls lay square eggs!

Right in the middle of the re-building operations at my castle, my XYL went down with pleurisy and pneumonia and the doctor was hurriedly called. Injections followed as a natural course, and my XYL, with tears in her eyes, is telling all and sundry that as she lay at death's door—her words, not mine or the doctor's—that her so-and-so Radio Amateur husband was more concerned in scrounging the plastic syringes from the doctor for coil formers, etc., etc., than he was in her rapidly deteriorating condition. To make matters worse, she also accused him of making coarse remarks and jokes as to where the needles were jabbed! Nobody understands me—yeah —yeah.

Received a letter from a VK4 S.w.l. this week, none other than L4024, and included was a very fine QSL card printed by the Ipswich City Council for the local radio club. Although a little off-standard for QSLs in physical size, the card is a splendid job and I feel sure that all who are lucky enough to receive one would be more than pleased, to say nothing of being interested with the view on the card of Ipswich and the relevant details of the city. L4024, or to give him his real name, Ben Hall, came in to see me at 5DN when he was over here visiting our salubrious city (VK4 please note!) and we had quite a session one night in the control room, and he turned out to be quite a guy. Nice to hear from you Ben, will be writing you soon. By the way, I am not that sweet with the Ye Ed. as you suggest—it is just that he recognises talent when he sees it!! More noughts on the horizon—maybe!

Our most gracious and noble President, Phil 5NN brought me in a bundle of Divisional bulletins this week with the suggestion that I might be able to use them to make up for the scarcity of news this month. I was overcome at this display of generosity and perused them with great interest. The VK6 bulletin impressed me most of all, probably my financial outlook and upbringing was the most impressed, on account of the discreet use of advertising on the front and back covers. This display of business acumen is one that could be copied with success by other Divisions and is to be well recommended. I managed to secure several paragraphs for the W.I.A. column in the local paper, the "Advertiser", and if this should, by some strange freak of circumstance meet the eye of any of those concerned with the various Divisional bulletins, I could use anything of news value from the other Divisions in the abovementioned column. If an odd copy or so should mysteriously find its way into my letterbox hot off the press, I will be more than pleased to give it the necessary publicity. How's that for diplomacy?

Wyck 5WM is deserting commercial radio for the field of t.v. with the local A.B.C. Makes me feel old—I remember when he started at the B.B.S.S. (for the benefit of any new readers, this means the Best Broadcasting Station in the State—if not in VK) as an office boy. Time certainly flies.

John 5JC phoned me this week with the news that the VK5 W.I.C.E.N. had been invited to join in a simulated emergency exercise with the Emergency Fire Services and the St. John Ambulance Brigade, to be held on 8th November, at the Mount Barker Oval. This is good news and quite a shot in the arm for W.I.C.E.N. in this State. Although from the details supplied, I am quite amazed at the number of cups of tea included in the afternoon's list of jobs and can only assume that the VK5 W.I.C.E.N. members will be on standby for the local fire brigade!

Well, padding or no padding, I have made it again, and my quota of pages for the month is complete. Had you worried, did I not, my palsy-walsy Ye Ed? Never fear, Pansy is near, keep that red pencil clear. Anyway, seeing that these notes will appear in the December issue, may I on behalf of the VK5 Division, its Council and members, wish you all the Season's Greetings and hope that 1965 will come up with all that you want it to. Speaking personally, I am finding it extremely hard to get my usual Xmas cards with the Pansy motif, but do not despair, Pansy will get there. I hope! 73, de 5PS—PanSy to you.

EXTRACTS FROM ELIZABETH AMATEUR RADIO CLUB PRESIDENT'S REPORT

The past year has once again been marked by increased membership and activities within the Elizabeth Amateur Radio Club. The total membership at the present time stands at 58 members. It has also been quite pleasing to note the marked increase in attendance at club meetings.

The administration has also seen a few changes, notably the Presidency and Treasury. Due to pressure of professional business, Tubby 5NO had to relinquish his position as President, and I was elected to complete his term of office. John 5QL, due to an occupational advance which resulted in his QTH becoming VK1, resigned as Treasurer and Bill 5WV was co-opted to complete John's term of office. Our thanks and appreciation are extended to Tubby and John for their efforts during their respective terms of office.

Once again the club decided against participating in the Elizabeth Birthday Celebrations, due to the commercial nature in which these proceedings are now conducted.

Next to the Christmas Social, the National Field Day Contest provides the most interest in club activities. This year, with the bitter taste of defeat still on our lips, the club was determined to restore our "lost" prestige, by outscoring "the mob from the east". In order to achieve this a new site, situated on Mr. John Barritt's property at Gawler, Town Hill, was used.

The most successful venture carried out within the club to date has been the publishing of "Info," the club magazine, which to date has seen 14 issues roll off the presses. This success is due mainly to the three co-editors: Ron 5FY, Angus 5DE and Tubby 5NO. The quality of the technical articles and features has been of the highest order; a standard which must be maintained if the success which "Info" enjoys is to continue.

During the past year the "Elizabethan Award" has again been much in demand, with 20 certificates being issued.

—C. J. Hurst.

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TASMANIA

Here it is holiday and festive month again. My but it comes round faster every year. Our worthy President, Tom 7AL, has got in early this time (he usually doesn't get a holiday at all), but at time of writing he is enjoying the sun and sights on VK4s Gold Coast; taken the family with him, so don't know how many shacks he'll be able to visit but I expect he will have a few eyeball QSOs.

The November general meeting was very well attended with thirty odd members present and Vice-President Ian 7ZZ in the chair. Following the business of the evening, an auction was held consisting of odd items held by the Division and various pieces brought along by members; almost all was disposed of at the usual rediculous prices, the whole affair being carried out most ably and with the usual repartee by Brian 7ZBE.

One of our visitors at the meeting was Arthur ZL3RE, from Christchurch, who was holidaying in VK7. He brought greetings from Christchurch to VK7 Amateurs, and Ian 7ZZ reciprocated on behalf of us all.

Our Hamfest will be over by the time this is received by members, and the post-mortem will have been held. Let's hope the results are not too bad. If you attended, then you've helped make it a success, and your criticism, either constructive or destructive, will help to make next year's effort even better.

The v.h.f. season is upon us once again and the Ross Hull Memorial Contest of course is THE contest starting this month, the 12th to be exact. I hope all VK7 v.h.f. men who can spare the time will compete this year and submit a log. Let's make it interesting and give the other Divisions a bit of a run. I'll admit, the likelihood of a VK7 member winning the trophy is remote, but we can show them we do operate on the v.h.f. bands, if we go about it the right way and see the contest through to its conclusion.

The Jamboree-on-the-Air this year was held here in variable conditions (both air and weather wise). All told, 32 Scout Groups were catered for by 20 Amateur Stations, all the VK and ZL divisions being worked. Let's hope for more stations and better band conditions next year.

Alan 7MY, who has been busy concreting and boat building for some months now, and consequently hasn't been heard on the air very much, has been in VK3 for a couple of weeks, visiting one of his daughters and the grand children. Hope you found them all OK Alan.

Our December v.h.f. meeting this year falls on Dec. 16. Keep it clear chaps, it will be once again a social meeting in the form of a barbecue at yours truly's QTH. Bring your own meat, etc. Glasses will be provided. Any visitors, either intrastate or Interstate, are welcome.

In closing, I must not forget to say that the President and Council extend to all members and readers the best Xmas and New Year Greetings from VK7 Division. "Far may your sigs radiate." 73, Geoff 7ZAS.

NORTH-WEST ZONE

There was almost a record attendance at our meeting on 6th October. Twenty-one members were present including newcomer Ivan Ling. Welcome Ivan, hope you enjoy yourself.

Had another letter from Basil 7BL, who now has a new call sign, VE6APO, but has yet to hear a VK signal from his new QTH at Spirit River. Keep listening Basil, we'll see what can be done.

Believe George 7XL is in hospital. Someone suggested George is having his voice raised so he can modulate his s.s.b. rig better. Not true, is it George? Hope you are soon up and about again.

Heard Bob 7ZAA and Winston 7ZWN talking about firing up on 6 metres soon. Anyone else interested? Also heard on the grapevine that a well known Poetina Ham is shifting to a new QTH at Devonport. Looks like another member for the N.W. Zone.

There was again an excellent attendance at our November meeting, there being 20 members present. We were pleased to see George 7XL there looking 100 per cent. fit again. The main interest for the evening was an excellent talk by David 7MS, complete with block diagrams and tape recorded, on the latest in communications receiver design. David had a thorough knowledge of his subject, and proved this by presenting the "piece de resistance"—his 20-valve receiver which had taken him over a year to construct. It is a very professional looking job and even has motorised tuning to get from one end of the band to the other in a hurry. David even gave a working demonstration and it worked fine business.

We were also presented with a film display on a.c. and d.c. theory and another on oscillators which proved very popular with some of our newer members.

Winston 7ZWN managed to work Den 7DK in Launceston from Sisters Hills at 5 and 8-9 on his portable gear. Nice work Winston. Bob 7ZAA has been attempting to bounce a signal off the satellite. Mike 7ZAV, Kevin and Winston have all been very active with v.h.f. mobile rigs, and good signals have been reported. Must be a sign of summer weather. Our old friend Max 7MX is still touring New Zealand. Half his luck. We expect to see a "hucka" at the next meeting, Max.

That's all for now, chaps, see you at the Hamfest at Campbelltown. 73, Ken 7KH.

HAMADS

Minimum 5/-, for thirty words. Extra words, 2d. each.

Advertisements under this heading will be accepted only from Amateurs and S.W.L's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. Copy must be received at P.O. Box 36, East Melbourne, C.2, Vic., by 8th of the month and remittance should accompany the advertisement.

FOR SALE: BC348 Receiver, speaker, A.c. Power Supply, Converted, Noise Limiter, S Meter, good order, £18. AR8 Receiver, A.c. Power Supply, Speaker, needs slight attention, £5. 35 Valley Pde., Glen Iris, Vic. Phone 29-7256.

FOR SALE: Collins 75A4 Rx with 6, 3.1 and 2.1 kc. Mech. Filters, £300. 32S1 Tx with A.c. Power Supply, £300. Both perfect condition. VK6RX, W. Clowes, 4 Nicholson Rd., Subiaco, W.A.

FOR SALE: E.I.L. Communications Receiver, HCR62, air tested, perfect condition, brand new, retail £75. Best offer. Write "Newsagency," Golden Square, Vic.

FOR SALE: Transmitter type AT14, complete with handbook and valves. 2 to 20 Mc., v.f.o. or crystal, £25. The power supply delivers 1,500v. at ½ amp. and 750v. at ½ amp. and appears to be worth the price by itself. Bob Boase, 50 Cardigan Street, Carlton, Vic. Phone Melbourne 34-9491.

HALLICRAFTERS HT32B Transmitter for sale. Mint condition, 10-80 metres coverage on s.s.b., a.m., c.w., 1 kc. accurate frequency read-out, high frequency hermetically sealed crystal sideband filter, 144 watts p.e.p. both sidebands on a.m. and s.s.b., 52 ohm pi-network output for harmonic suppression, logarithmic meter for precise tuning and carrier level adjustments, high stability de luxe construction, £425 or near offer. Hallicrafters SX115 triple conversion Receiver for sale, condition, 10-80 metres coverage on s.s.b., a.m., c.w., 1 kc. accuracy frequency read-out, product detector for s.s.b./c.w. envelope detector for a.m., separate noise limiters for a.m. and s.s.b./c.w., selectivity variable from 500 to 5,000 cycles, built-in 100 kc. crystal calibrator, sensitivity less 1 microvolt, S meter functions with a.v.c. off, £400 or near offer. H. Clem, VK4HC, 7 Molloy St., Silkstone, Ipswich, Qld. Phone 81-2360.

RECEIVER 1155 in rack, £30 or best offer. Tech TC2 Tube Tester, £10. G. Williamson, VK3GW, 62 French St., Lalor, Vic. Phone 46-6586.

SELL: Swan 120, 14-14350 kc., pwr. spy., mic., spk., see "A.R." Jan '63. AR7 Rec., good clean condition, £25. VK2WS.

SELL: Two Power Supply Units, 240v. a.c. input, 750v. at 230 mA. output, 12v. and 6v. fils., good regulation, £8 each. Other smaller units. No. 128 Transceiver, 2-4.5 Mc., less power supply, suit boat, car, £3/10/0. BC348 Communications Receiver, A1 order, some spares, £30. 1 mile 100 lb. copper soft wire (heavy gauge), ideal for rhombics, etc., £15. Also assortment Trannies, Chokes, d. spaced Tx condx, etc. VK4SS Al Shawsmith, 35 Whynot St., West End, Brisbane, Qld. Phone 4-6526 before 4 p.m.

SELL: 7 ft. Tx Rack, £5. Type 3 Mk. II., with modulator (no mike), £22½. No. 122 Set, £12½. HRO Receiver, bandspread coils, £40. CRO 1" tube, complete, £5. CRO, 2" tube, type 902, £2. Modulator, comprising zero bias 807s (no tubes), Woden mod. trans. (120w. audio), A & R input transformer, £8/10/0. Power Transformer, 1250, 750/750, 1250, 150 mA., and Choke, 150 mA., £5 pair. Power Transformer, A & R, 565, 425/425, 565, 250 mA., A & R Swinging Choke, 300 mA., £6 pair. Power Transformer, A & R, 400/400, 150 mA., A & R Choke, 200 mA., £4½ pair. Power Transformer, 385/385, 300 mA., Choke, 200 mA., £5 pair. Russell Bradshaw, VK3SX, Phone 82-2152 (Melbourne).

STEP-DOWN Transformer, 240v. to 115v., 5k.v.a., in original packing case, £25 collect. Dineen, VK3TD, Mt. Eliza, Vic. Phone 7-1407, or office 544-0361.

V.H.F. Sell-up.—Crystals, frequencies in kc.: 1600, 1605, 1650, 2505, 3535, 3655, 4360, 4980, 5000, 5475, 6005, 6250, 6275, 6300, 6312, 6440, 6825, 7010, 8000, 8010, 8190, 8230, 8371, 8498, 8790, 15110. Valves: 12AU7s, 12AT7s, 6AL5s, 6CQ6s, 6BX6s, 6CH6s, 6AM6s, 6BY7s, VR150s, also OA211s. New Electrolytics: 200 μF., 200 volt. All above items are 7/6 each or 3 for £1. Crystals: 40,000 kc., 42,444 kc. (50 Mc. i.f. on 432 Mc.) and 48,015 kc., all £1 each. Brand New Valves: QQE06/40 £4; TD03/10s £1; A2521s (out-performs the 417A on 432 Mc.) £1. Slightly Used Valves, all guaranteed: QQE06/40 £3; QQC04/15 £1; QQE03/12 £1; 4/65A £3; also OC28s £3 a pair. I.F. Transformers: 50 kc., 85 kc., 100 kc., £1 a pair. Co-ax: RG8/U equivalent, 75 ft. lengths, £1; UR70, 75 ft. lengths, £1. Valve Sockets: QQE06/40 type 10/-; 4/125A, QB3/300 type 10/-; 9-pin and 7-pin P.T.F.E. 3/-; 9-pin ceramic 2/-. V.h.f. Trimmers: 0.5 to 4 pF. and 0.5 to 7 pF., 6d. each, 5/- a dozen. 25 pF. and 50 pF. 2/6 each. Postage 2/6 on every order. Be quick! A. C. Rechner, 13 Blamey Ave., Broadview, South Aust.

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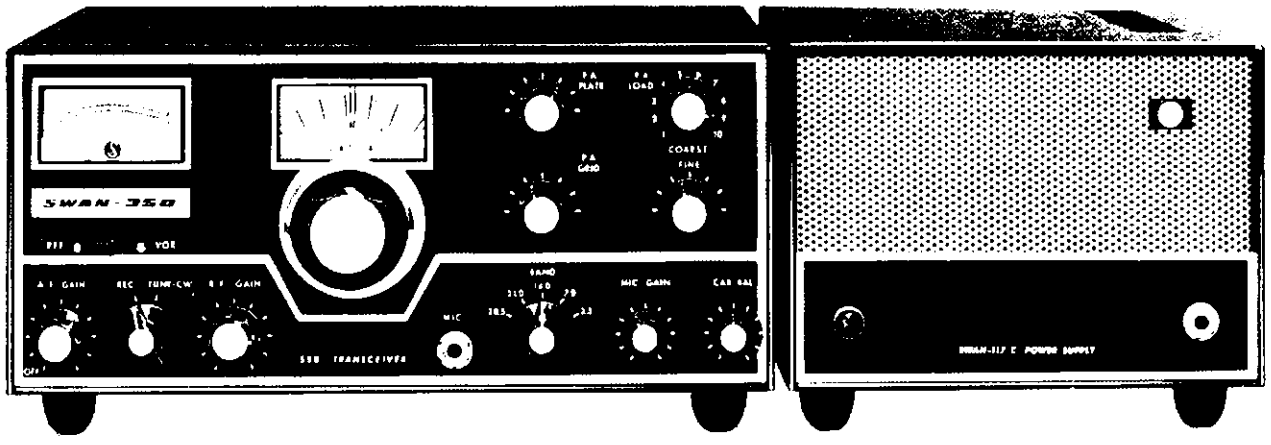

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