

**THE
AUSTRALASIAN**

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Radio World

1/-

VOL. 10 NO. 11

APRIL 1946



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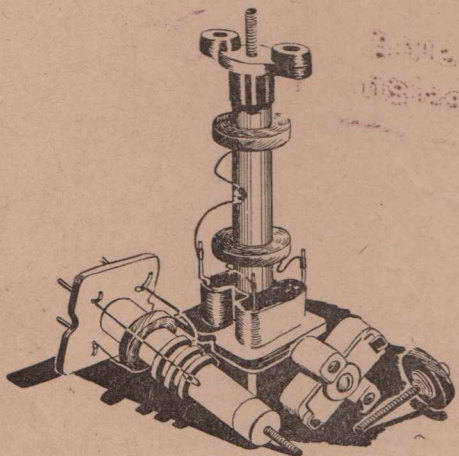
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APRIL, 1946

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EDITORIAL

There seems to be considerable disappointment expressed by our readers in regard to the lack of startling developments in receiver design. Not only our readers, but the public in general seems to feel that the amount of work done on radar and radio equipment for the forces should have brought to light something worthwhile for incorporation in post-war receivers.

The commercial receivers now being placed on the market seem to be very little different from pre-war sets, except in regard to prices, these having gone up with the general trend of the money market. Neither do our own issues bristle with new ideas in technical development, as several of our readers have pointed out to us in no uncertain terms.

Frankly, that is just how it is. The wartime developments will be very much in evidence when we get around to battery portables, with the new peanut valves and the lightweight minimax batteries; there is also plenty of scope for experimentation on the higher frequencies, but ordinary broadcast receivers appear to have reached a certain amount of stagnation.

We don't expect this position to remain indefinitely and we have two outstanding developments in hand in our own lab., waiting for a bit more work to be done before they are released, but otherwise we feel that we can best fill in time by commercial organisation, keeping the needs of the experimenter before the manufacturers of components, and generally paving the way for the radio enthusiast to pursue his hobby under ideal conditions.

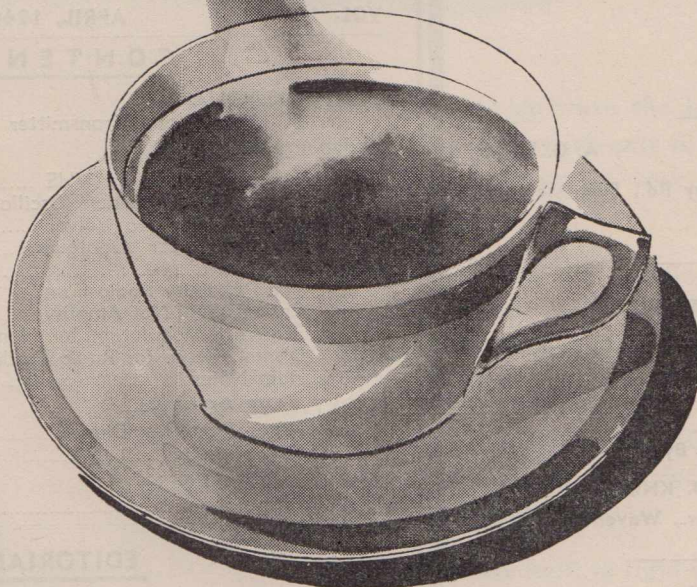
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and Burnie, Tas.

EFFICIENT AERIALS FOR V.H.F.

Ground-plane antenna recommended for hams

BECAUSE at comparatively lower frequencies it is the usual thing to obtain fair communication results with any old wire as an antenna, the graduate to higher frequencies is likely to gain a wrong impression of the practical utility of V.H.F.'s by treating the antenna as an afterthought. It's the same story—but more so: "An efficient antenna is still half the battle," and when it comes to V.H.F. working it is much

that it was the late Ross A. Hull who set the fashion for the future in 1933 by application of his four half-waves-in-phase-plus-reflectors array on 56 Mc/s. From then on, the picture changed and the world literally "woke up" to "Five Metres."

DX on 56 Mc/s

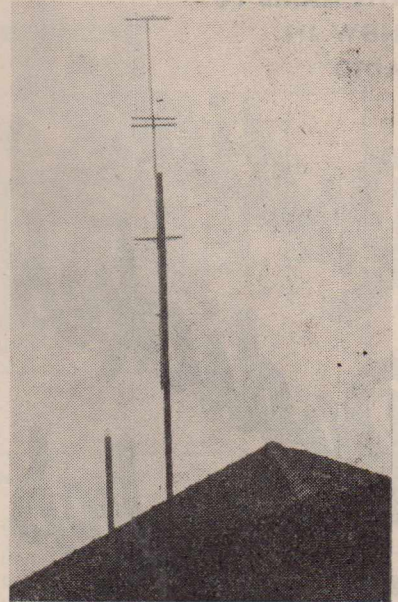
Seriously minded experimenters followed Hull's lead and got busy on high-gain directive arrays of all kinds. Before long American amateurs were working transcontinental on "Five." For DX working on 56 Mc/s, there were always two schools, one for vertically and the other for horizontally polarised antennae. When double-hop or air-mass bending results in 1000-mile (or more) DX, initial polarisation seems inconsequential, but it is conceded generally that vertical polarisation at transmitter and receiver is desirable for best results locally. 50-54 and 166-170 Mc/s may be considered primarily as purely "local" channels, with utility for a good signal path within a radius covering most metropolitan and suburban areas. With efficient radiation at the transmitting end the supposedly "optical" signal path may be extended considerably. Main thing is to transfer R.F. from the transmitter with as little loss as

By

DON B. KNOCK

(VK2NO)

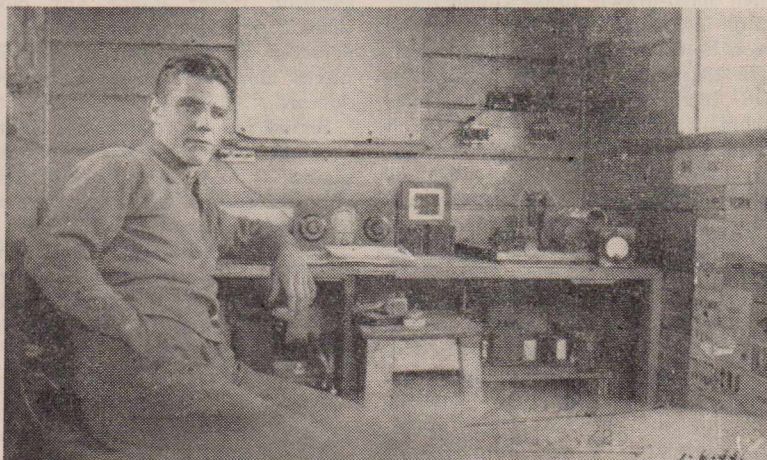
more than 50 per cent. of that consideration. For many years before the blight of war blanketed the world for the second time, lots had been written in Ham and other publications, far and wide, about antenna design. There was plenty of emphasis on directive arrays for 28 Mc/s. and 14 Mc/s, with a fair amount of guidance on arrays for 56 Mc/s. Examine the history of really **effective** direct-ray communication at V.H.F.'s and you will see



Aerials like this are sprouting over residences where Hams abound. This one, a vertical W8JK, was used by VK2CI at Mereweather, N.S.W., for work on the pre-war 56 Mc/s band.

possible, and it isn't done by stringing a bit of wire of any kind up with a length of lampcord as the feeder! The length of wire, split at the centre **may** be considered as a half-wave dipole in itself, but how much R.F. gets to it is another matter, especially where an attempt is made to use the antenna well above ground. Various amateur handbooks give enough information on pros and cons of feedlines to show the Ham just what works and what doesn't. Objective of the average V.H.F. station is to put out the strongest possible signal equally in all directions, and the antenna described here is one that possesses this desirable characteristic. It is, at first glance, a similar assembly to the familiar "turnstile" but actually a more effective application. Based essentially on the use of co-axial cable feedline, it is a quarter wave radiator with its own simulated earth screen, plus matching stub for co-ax. feed. Outstanding virtues are:

- (1) Gives greatest possible circular ground propagation pattern.
 - (2) Is properly terminated, irre-
- (Continued on next page)

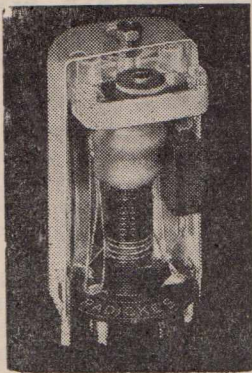


An Australian amateur station of pre-war vintage, VK2DQ, Broken Hill, N.S.W. Note the T.N.T. oscillator using a Philips TC 04/10, on the right. The owner-op, "Dud" Nourse, is one of the lads who recently flew Lancasters over "D Land" with the R.A.A.F.

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AERIALS

(Continued)

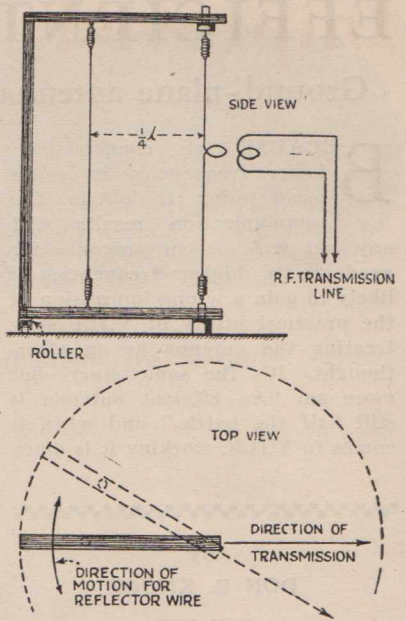
- spective of height above ground.
- (3) Co-axial outer conductor is not exposed to R.F. fields.
 - (4) Structure can be directly earthed as protection against lightning.
 - (5) Is not difficult to construct.
 - (6) Does not require any field adjustments.

It is well known that a suitable vertical antenna situated over a perfect earth gives low angle radiation. An incorrectly terminated co-axial feedline will result in standing waves along the line. Therefore it becomes desirable not only to ensure correct termination but to screen the line effectively from external R.F. energy.

Final consideration is that of peak resonance. There should be no need for cut and try procedure as a result of resonance peak before and after positioning the antenna. Changes in feeder position should not affect antenna resonance. All these things are taken care of by the ground plane antenna, the diagram of which is pictured here.

Assembly

Assembly comprises three positions, including the quarter-wave radiator A, the matching stub S, and the radials S. Actual construction is a matter for individual taste, and in the writer's case his 50 Mc/s array takes the following form: The antenna rod (which continues down to the bottom of the tubular stub) is made of quarter-inch hard-drawn brass tubing; the stub is 3-inch diameter galvanised iron down-spouting, and the radials are lengths of light bamboo with D8 telephone wire strung along them. Obviously it will be a much more satisfactory job constructionally if brass, copper, or dural is used throughout. Where the antenna rod passes through the disc of insulating material (half-inch polystyrene) to continue down the stub, the inner conductor of the co-ax. cable is connected as shown. The outer (braid) connects to the top of the stub (and the radials). The stub is closed at the bottom by shorting the antenna rod to it by a metal disc or bar, which, with advantage, could be arranged for adjustment by sliding inside the tubing. In practice the writer finds that with the dimensions given, ad-



A useful idea for a roof-top beam aerial. The reflector swings around the radiator on a wooden frame, supported by a roller.

justment is not imperative because of the broadly resonant characteristics of the system.

Dimensions for 50-54 Mc/s are:

A = 4 feet 8 inches

S = 2 feet 4 inches

R = 4 feet 10 inches

An obvious advantage is that the bottom of the stub, being at zero R.F., can be earthed directly. Using this array about 30 feet above ground at VK2NO, with 80 watts input to the transmitter, a vast amount of R.F. is present in the antenna—enough to burn out absorption meter lamps any closer than 6 inches—and no R.F. can be detected in the form of standing waves along the co-ax. outer conductor.

Signal reports around the Sydney area and in the Blue Mountains region 70 miles distant are of maximum strength, exceeding pre-war 56 Mc/s reports.

For 166-170 Mc/s, such an array is quite diminutive and hence can be made up solidly without concern for overall weight. Dimensions for 166-170 Mc/s are:

A = 16½ inches

S = 8½ inches

R = 17 inches

In this case the stub is made of 1½-inch diameter tubing. The same condition as to matching exists. With a 20-watt oscillator at 166

(Continued on page 23)

OSCILLATOR

(Continued)

valve is to increase the plate current, but this does not always hold true. Between the oscillator plate and signal grid of a pentagrid converter this negative resistance exists as applying a negative voltage to the signal grid will cause an increase in the current flow to the oscillator plate. The negative potential on the grid will repel electrons, causing a greater number of them to flow to the oscillator plate, which is a greater current flow and means the instantaneous voltages on both electrodes will be in phase and self oscillation will be produced by coupling control grid and oscillator plate by a condenser.

For clearness it is here pointed out that only pentagrid converter types such as the 6A7, 6A8 or 6A8G are suitable, the 6J8G and 6K8G being definitely not so.

Buffer Stage

Applying modulation to an oscillating valve is not the best idea in the world and the placing of a load on the oscillator tends to vary the frequency of oscillation, although the negative resistance oscillator is unusually free from these effects.

A buffer, periodic or untuned R.M. amplifying valve, three names for a similar device, is an asset in any oscillator, but the extra valve required generally excludes its use.

By using a 6J8G the problem of the extra valve is overcome as it performs the dual operation of a buffer stage and an audio oscillator. The pentode section is used as the buffer stage and the triode as the audio oscillator.

In the 6J8G there is a coupling grid between the triode and the heptode, but this coupling is of a very low value and the modulation caused by it is sufficiently low to be disregarded. However, if it is desired to produce an unmodulated signal the audio oscillator may be easily turned off, which seems to be a more satisfactory way than turning the modulation control to zero, as in most circuits some coupling to the A.F. oscillator seems to remain.

Modulation of the heptode section was caused by plate type of modulation. Screen modulation was considered and tried and appeared to be satisfactory, but the fact of

the 180 degrees phase difference between the modulation applied to the injector and screen grids made it bad practice. By applying the output of the audio oscillator from its plate circuit to the plate circuit of the heptode amplifying valve keeps the two modulation voltages in phase and the electron transit time between these two electrodes should be sufficiently small to have negligible effect.

Audio Oscillator

The audio frequency oscillator consists of the now more or less common arrangement of using the primary of a centre-tapped input speaker transformer. A 10,000-ohm plate-to-plate transformer was used as it happened to be on hand and the circuit constants shown should produce a note of about 400 c.p.s., which is the one most commonly used. Decreasing the grid-leak resistance of the triode oscillator will increase the note frequency generated and by increasing the capacity of the condenser tuning the audio transformer will decrease the frequency of the note generated.

Plate Circuit 6A7

It will be noted that the plate load resistance of the 6A7 consists of a 1,000-ohm wire-wound resistance, which, although unorthodox, works very well.

A W.W. resistor in this position seems more satisfactory than a carbon one at R.F., probably due to the increased impedance due to the "skin effect" and does not develop a large voltage drop as a suitable carbon resistance. It has the advantage over an R.F. choke in that it would be impossible for it to have a resonant frequency which is necessary in multi-band operation.

The use of a W.W. resistor was "discovered" when producing a buffer stage for b.c. receivers used on shipboard during wartime as any receiver capable of oscillating and radiating from the aerial were prohibited unless used with such a buffer.

Buffers engineered and manufactured ashore, the ones I saw anyway, all suffered from the same disadvantage, severe damping on short-waves, which is where those at sea do the most listening. This damping effect was almost completely overcome by replacing the plate circuit resistance with a W.W. one of five or ten thousand ohms.

Variable Modulation

Variable modulation percentage was not used in the original design as it was found that in certain position the control potentiometer varied the note of the A.F. oscillator. A suitable circuit is shown in case required.

Coils

The wave ranges covered in the original instrument were six in all, from 23 megacycles to 100 kilocycles on fundamentals.

The short-wave coils consisted of standard receiver aerial coils, disregarding the aerial coupling winding. For the broadcast band a similar coil was used, but of the mid-frequency type, while for the low frequency bands single windings from an old 175 Kc/s I.F. transformer were used, removing turns until the required range was covered. This idea saves space and a good deal of monotonous coil winding.

Construction

The cardinal rule for building this piece of test equipment is extreme mechanical rigidity and it cannot be over emphasised. The whole device cannot be any better than the electrical stability of the tuned oscillatory circuit, which goes hand in hand with the mechanical rigidity, especially on the short-wave ranges, where it only requires a small movement of a wire to upset the dial calibration.

Point-to-point wiring is satisfactory, but bends in the wire should be avoided no matter how pretty it makes the final job look. All the coils and wave change switch should be firmly mounted on the chassis, which should be of the four-sided type.

The Dial

The dial should be the best one procurable and be capable of being reset with the best possible accuracy. It should be free from backlash, smooth in action, and placing the fingers on or off the tuning knob should not affect the frequency.

Attenuator

The attenuator is merely a wire-wound potentiometer and is satisfactory, but suffers from the disadvantage of not providing a constant impedance output with a variation in signal output. If this is to be overcome a fair bit of electrical shielding is required and

(Continued on page 9)

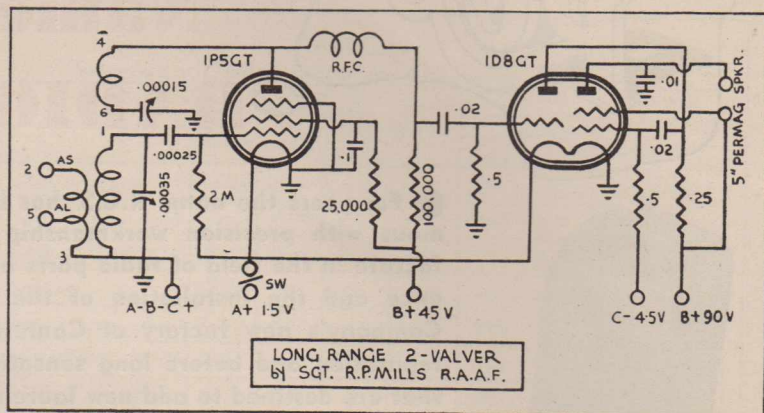
LONG-RANGE TWO-VALVER

A Handy Little Set for Battery Operation

HERE is the circuit of a small, economical set with excellent range and selectivity. I designed it up around odd pieces of junk which were on hand and was more than pleased with the results. On local stations enough volume can be obtained from the loudspeaker to fill a fair-sized room. Selectivity is very sharp, compar-

By

Sgt. R. P. MILLS
Group 817, R.A.A.F.
Townsville



ing favourably with a normal set using one stage of R.F. At night I have been able to receive at good strength Brisbane and Sydney stations from Townsville.

I am using an R.C.S. Reinartz coil but have had good results with

a homewound coil using 32 s.w.g. enamelled wire on a 1½-inch former (30 turns tapped 15 for aerial coil, 120 turns for grid coil and 40 turns spaced ¼-inch from grid coil for the reaction). It was found that the screen and plate resistances for the IP5GT were critical to give good selectivity and sensitivity.

I have made up quite a few of these sets now, some using screen reaction and others with condenser. Battery consumption is very small, averaging 3-500 hours' life from a portable "A" battery or No. 6 cell, which is not too bad for the tropical area. By reducing the IP5GT plate and screen supply to 45 volts, reaction was much smoother. At present I have both the ID8GT and IP5GT working off one 45-volt battery and am getting ample volume from locals up to 50 miles distant, using a 50ft. exterior aerial. An earth wire makes an appreciable gain in signal strength.

OSCILLATOR

(Continued)

a switching arrangement, also a lot of experimenting.

The output from the attenuator should be carefully shielded from where it leaves the pot. to where it enters the receiver, as otherwise trouble may be encountered in obtaining a sufficiently low output and the signal entering the receiver under test in circuits where it is undesirable.

Power Supply

In my case an external power supply was the only one available. However, it is just a matter of whatever is the most suitable and convenient to the constructor. The only point to be watched is to provide sufficient R.F. filtering for the power lines entering the unit in it, as otherwise it is possible for the R.F. to enter the receiver under test from the common power lines.

Shielded Box

The shielded steel cabinet and the

chassis were made to order by a sheet metal worker at Camperdown, Sydney, with the valve socket holes in the chassis, the lot costing 27 and can be ducoed or cracked finished to give the real "professional appearance" and to my mind was money well spent. A glance through the pink-pages of the telephone directory should locate one.

Calibration

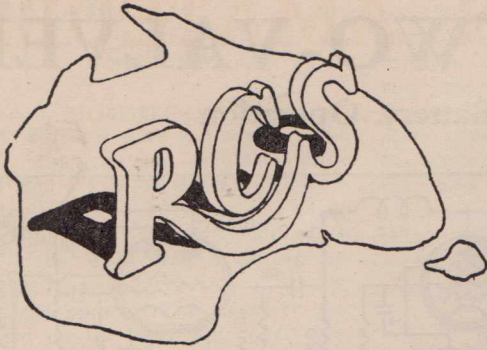
I was very fortunate in having calibrated receivers available for every range used, which simplified matters considerably. It is possible to beat the harmonics of the oscillator with broadcast stations to obtain several plot points to draw a calibration curve. On the short-wave band and broadcast band the oscillator can be tuned to zero beat with stations of known frequency, care being taken to see the fundamental of the oscillator is being used and not a harmonic. This method should be familiar to anyone undertaking to build this instrument.

CHINESE RADIO PUZZLE

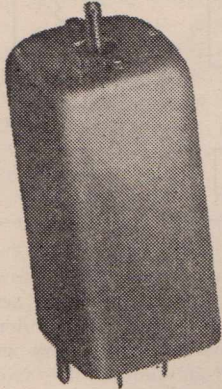
American and Chinese authorities are amazed these days at a radio station assumed to be operating somewhere in China on 1,450 kc/s, and being on the air uninterrupted for 24 hours a day. This station is broadcasting only American music of transcriptions and records, with hardly any repetition of the selections. Thus, it is believed that there must be a tremendous store of records from whichever source the station operates—and even more astounding is the fact that not a single spoken word is heard during the entire day's broadcasts.

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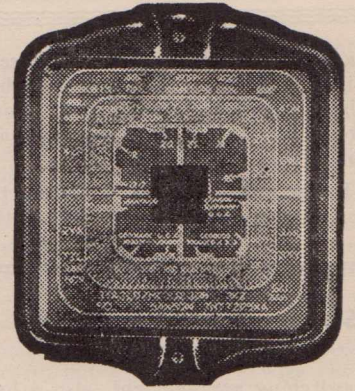
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- IF 163
- IE 74 Permeability tuned: 175 K.C.
- IE 75

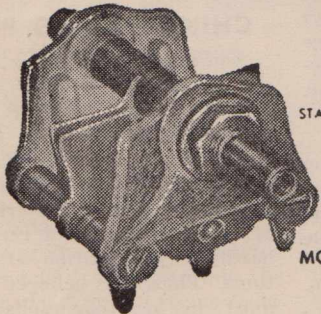


DA7

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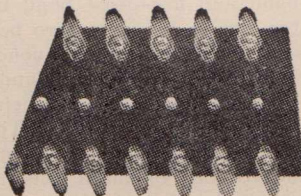
Max. Cap. Min. Cap.
MMFD. MMFD. Plates

STAR	CV34	10	3	2
	CV35	15	3	3
	CV36	25	3.5	4
	CV37	35	4	5
	CV38	50	4	7
CV39	70	5	9	
CV40	100	6	14	
MC	CV41	10	3	2
	CV42	15	3	3
	CV43	25	3.5	4
	CV44	35	4	5
	CV45	50	4	7
	CV46	70	5	9
	CV47	100	6	14

R.C.S. PANEL STRIPS

These strips are precision punched from first grade 1-16in. black bakelite. The solder lugs are spaced with 1/2 in. centres.

- Type MS7 2in. wide.
- Type MS8 1/2 in. wide.



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POLYSTYRENE FOR AMATEURS

Essential Insulating Material For Higher Frequencies

At the lowest frequency at which amateur transmitting stations are now allowed to operate is 28-29 Mc/s, high frequency insulating material such as polystyrene becomes prominent in the minds of amateurs, as such insulation is almost essential to their transmitters and receivers.

Polystyrene is one of the best high frequency insulating materials, and it is therefore of interest to know that supplies of this material in the form of annealed sheets and rods, are now available from a local manufacturer—Etholox Plastics, 108 Chapel Street, Windsor, Victoria. The sheet and rod material is supplied in an annealed condition, so that it can be easily cut with a hacksaw or drilled with a conventional breast-drill, thus enabling amateurs to make insulating strips, aerial feeder spacers, insulators, etc., to suit their individual requirements.

Local Manufacture

In the early war years, stocks of polystyrene sheet and rod in this country were almost nil. A demand for this material arose to meet the requirements of the Armed Forces' locally-manufactured radar and radio equipments. Supplies of poly-

By

J. G. DU FAUR, B.E.,
A.M.I.E. (Aust.), A.M.I.R.E.
(Aust.)

styrene powder were imported from overseas, following which local firms were invited to process the material into sheet and rod form. It was immediately found that the material was difficult to handle. Products of the few firms who took the project seriously generally contained large bubbles, which rendered portions of the rods and sheets made useless and in most cases the finished product was so brittle that it could not be machined without cracking. In some cases large insulators which were

TABLE I
PROPERTIES OF COMMONLY USED HIGH FREQUENCY INSULATORS.

MATERIAL	DIELECTRIC CONSTANT	% POWER FACTOR (1 Mc/s)	% WATER ABSORPT. 22 HOURS	SPECIFIC GRAVITY	SOFTENING POINT DEG. C.	COEFF. LINEAR EXPANSION PARTS PER 100	STRENGTH LBS. PER SQ. IN.	
							TENSILE	COMPRESSION
POLYSTYRENE	2.4-2.9	0.03	0.01	1.05	90	70	7,500	14,000
STEATITE (Low Loss)	6.0	0.04	0.07	2.6	2550	70	9,000	30,000
HARD RUBBER	2-3	0.5-0.9	0.02	1.15	70	70-80	5,500	7,000
PORCELAIN - WET PROCESS	6.5-7	6.0	NIL	2.4	1610	4.5	4,500	40,000
MICA - CLEAR INDIA	7-7.3	0.02		2.8	1200	3-7		
METHACRYLIC RESIN	2.8	2.0	0.3	1.19	135	70	8,500	12,000
GLASS - PYREX	4.5	0.2	0	2.25	600	3.2		10,000
ETHYL CELLULOSE	4-4.2	2.5-5	1.7-2	1.15	150			
CELLULOSE ACETATE	6-8	3-6	4.0	1.3	70	150	3,000	4,000

turned from rod and assembled in transmitters broke, without warning, into small fragments, owing to their high internal strains.

Australian Success

Mr. L. G. Wallace, proprietor of Etholox Plastics, persevered with the problem. After considerable experimentation, he produced satisfactory rods with the use of a plastic extruding equipment. It was found that the extrusion principle enabled a soft and easily workable material to be processed. In the past, local manufacturers had been using the injection moulding principle, in which the powder is forced into a die, under extremely high pressure. This method proved to be excellent for the processing of small mouldings, but, owing to the cooling effect of the die, such products were generally too brittle for further machining, and annealing presented various difficulties.

Mr. Wallace's first extruder was a small machine designed for the extrusion of other plastics and capable only of withstanding low internal pressures. To extrude polystyrene it was found that 20 tons per sq. in. was necessary and so a much stronger and larger machine was built for the job. The new extrusion barrel (which was made from a rejected 6-inch gun barrel) was designed to withstand the high

pressure involved, and was fitted with a stainless steel liner.

After some months the larger machine was completed and turned out to be an absolute success. By means of a special device the formation of bubbles during the cooling process was overcome, and thus good quality locally-processed sheet and rod became readily available.

Sizes

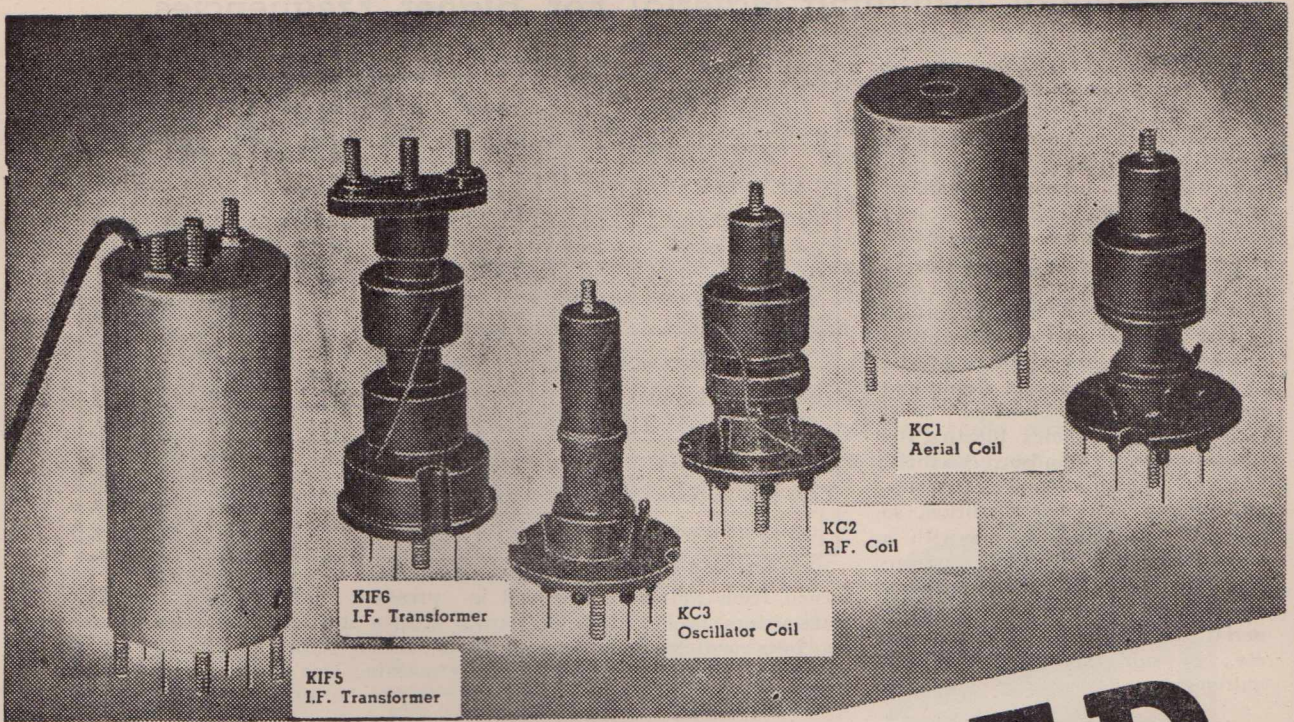
Etholox Plastics are at present making sheets in thicknesses varying from 1/16in. to 1in. These are normally supplied in two standard sizes: 20in. by 20in. and 5in. by 10in. However, special sizes can be supplied if required. Rod is available in all diameters from 1/4in. to 2 1/2in. in standard lengths of 1, 2, 3, or 4ft. Tubing has so far not been made, but dies for tubes are at present being manufactured, and thus this form of the material should soon be available.

Properties

High frequency equipment insulated with polystyrene gives efficiency of the highest order. This material has practically zero water absorption, is free from attack by acids, alkalis, alcohol, weather, etc., and has a dielectric strength comparable with that of high-grade mica; such properties make it one of the best insulators available for the electronic high

(Continued on page 13c)


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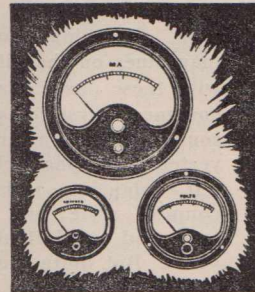
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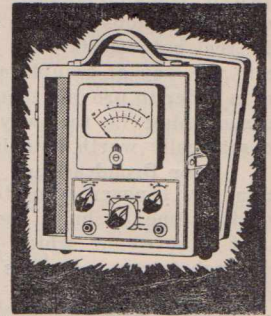
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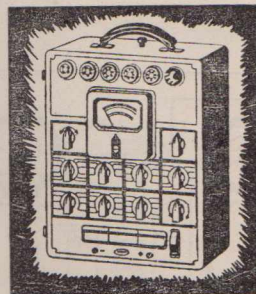
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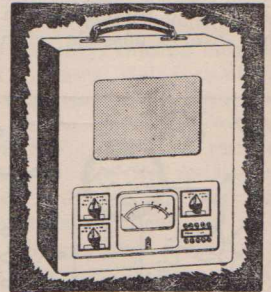
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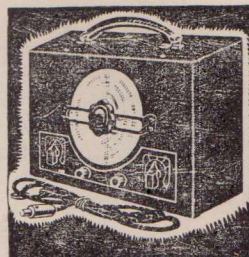
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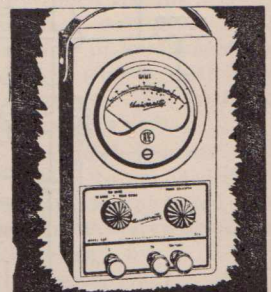
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Fully illustrated literature available upon request.

POLYSTYRENE

(Continued)

cement is spread over the surfaces to be joined. The pieces should be held together under light pressure. The solvent in the solution evaporates or is absorbing, leaving a joining surface. It is not necessary for perfectly fitting surfaces, as the dissolved polystyrene in the cement will fill small surface irregularities. However, close tolerances cannot be maintained because the dissolved layer of plastic will vary with each application of cement. The bond will take from 12 to 36 hours to dry because a large amount of solvent is introduced at the joint.

A polystyrene varnish known as Stylon Tropical Lacquer is also available from Etholox Plastics. This is suitable for tropical proofing, as a coil dope, and for general resistance against moisture absorption.

Use in U.H.F. Equipment

In U.H.F. experimental work, one of the difficult components for amateurs to obtain is a satisfactory tuning condenser, at a low cost. One

way over this problem is to procure new or second-hand trimmers and larger condensers of the broadcast type and replace the existing insulation in them with polystyrene strips. Although some makes of variable condenser do not lend themselves readily to this alteration, in many types the only insulation consists of rectangular strips, suitably drilled, so that the stator plates can be bolted to them.

With these, it is a simple matter to change over to polystyrene insulation throughout. In this regard the writer's home-made all-wave receiver has two R.F. stages and consequently a four-gang tuning condenser. This condenser originally was an old type broadcast-band unit, each section having a maximum capacity of approximately .0005 microfarads. A number of the plates in each section were removed to reduce the capacity of each condenser to approximately .00015 microfarads; then all insulation was replaced with 3/16in. polystyrene sheet. Additional wipers were fitted to the condenser to reduce R.F.

losses, following which the unit turned out to be most satisfactory for high frequency use.

When purchasing old condensers for conversion to U.H.F. use it is important to use only units which have clean shiny plates and substantial tight fitting bearings. Where the condensers have ball bearings or steel shafts, one should make sure that a low R.F. resistance wiper or connector is fitted between the rotor and the rotor connecting terminal, as if R.F. current has to pass through a ball-bearing or steel component, considerable losses may result. Also, where possible, sharp corners on condenser plates should be rounded off to reduce concentration of R.F. at these points. Care should be taken to ensure that receiving condensers, which have been modified as suggested above, will withstand the high voltages subjected to them, if used in transmitters. As a general rule they are satisfactory, except in the final amplifier stage where transmitting condensers with wider plate spacing are necessary.

For the construction of transmitters, polystyrene sheet and rod is unsurpassable for tank coil holders, aerial terminal mountings, etc. Where air-core tank coils are used, polystyrene strips may be cemented to these to improve rigidity and stability, causing only negligible R.F. losses. Half-inch diameter polystyrene rod is ideal for use as aerial feeder spreaders, owing to its high R.F. insulation resistance, its lightness and its resistance to weather conditions. In this respect thin sheet is excellent for making lead-in changeover blocks and doublet noise-reducing receiving aerials.

Polystyrene is not recommended for use as insulation in the oscillator section of frequency meters or in any tuned circuits where precise frequency stability is required, as dimensions of components made from it vary slightly with changes in temperature. In such cases steatite is preferable.

Acknowledgments

It is desired to acknowledge that the above article was based on data published in "Polystyrene for War-time Electronics," by F. E. Wiley, Modern Plastics, August, 1943, and "Di-electrics for Radio and Electronic Applications," by A. C. Matthews, Radio, November, 1943.

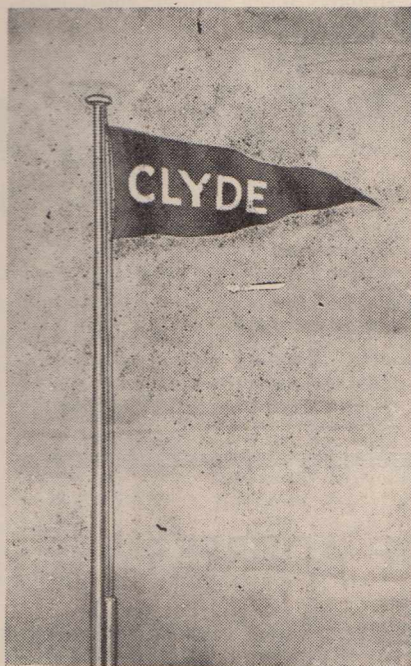
IT CARRIED A MESSAGE

Sometimes the flag flew at half mast; sometimes (alas) it was furled. But on happier occasions when it fluttered at mast-top it brought a message of good news to many a North Queensland motorist.

The Clyde flag was an ingenious idea put into practice by a progressive business woman, Miss Jessie Swales, of the Swales Engineering Co., Townsville. Throughout the war years, when customer and dealer alike suffered the monotonous Clyde flag was used to give the motor user an indication of his chances of buying a Clyde battery.

When at mast-top he knew that the opportunity was favourable (depending upon his priority). As stocks were sold the flag was lowered foot by foot to the roof of the Swales Engineering premises, thus telling the story that the shelves were bare.

Clyde Batteries Pty. Ltd. are doing their best to keep the flag at top for all dealers. Although the position regarding supplies is a little more favourable than in the war years, battery output can only be improved by the release of experienced craftsmen from the Ser-



vices, and essential materials of the type that will keep up the standard of these well-known batteries.



Miss Jones
has clever
fingers . .

Here she is at work assembling meters, a delicate and painstaking job. Just one of the many skilled Australian men and women who after a magnificent war job at "University" are now turning out ever increasing numbers of fine electrical and radio indicating equipment for general needs.



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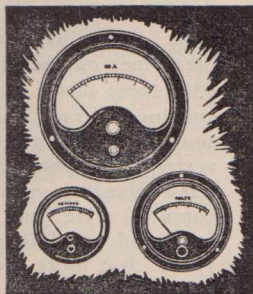
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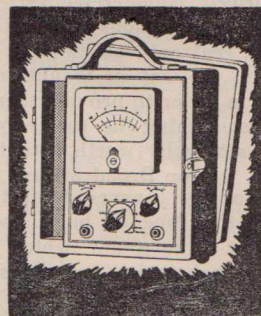
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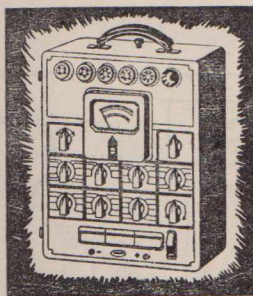
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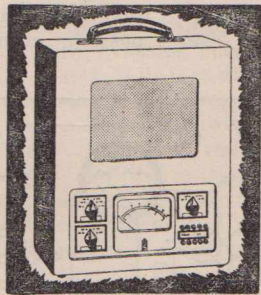
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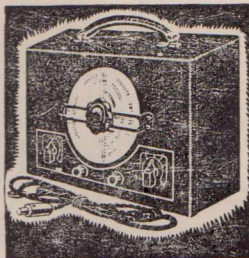
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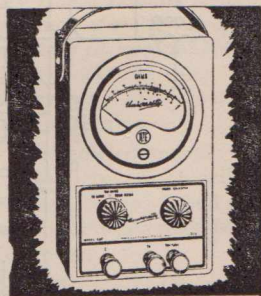
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THE PROXIMITY RADIO FUSE

Radio transceiver built into nose of shell

ONE of the most interesting of the wartime secrets now released is the use of radio automatically to operate the fuse of a shell when within lethal range of an aircraft or other target. In that the method depends on the use of a signal reflected from the aircraft, it is analogous to radar; but there its resemblance ceases.

The proximity fuse consists of a complete transmitter and receiver, with aerial, batteries, and the fuse-operating mechanism built into the nose of an anti-aircraft shell! It is a beautiful example of modern miniature technique! The compression of the apparatus was not the least of the headaches which confronted the designers, however. Sufficient ruggedness to withstand an acceleration some 20,000 times that of gravity was needed in both apparatus and valves.

The fuse depends on the "Dopp-

ler" effect for its operation. This effect is well known in acoustics, but it is not normally noticeable in radio. It occurs when the source of radiation is moving relative to the receiver and it changes the apparent velocity by the velocity of relative motion.

Most people must have noticed that the whistle of an express train changes pitch as it passes one. When the train is approaching there are more cycles per second reaching the observer than when it is receding from him, consequently the pitch drops as the train passes. The velocity of sound in air is about 1,100ft. per second, so that the wavelength of a note of 1,000 c/s is 1.1ft. If the train is moving at 60 m.p.h. (88ft. per sec.) and the whistle is of this frequency, then the effect is as if the velocity of sound had increased to 1,188ft. per sec. when the train is coming towards an observer, and 1,012ft. per

sec. when it is going away from him. He, therefore, hears notes of 1,080 c/s and 920 c/s in the two cases.

This principle applies also to wireless waves, but on account of the high velocity of propagation of such waves, the change of frequency is appreciable only when the relative velocity of transmitter and receiver is high, as in the case of a shell. In the proximity fuse, the transmitter generates a continuous wave which is emitted from the nose of the shell as a cone of radiation. This travels to the target and is reflected by it and travels back to the shell. This received signal differs in frequency from the radiated because of the relative motion of the shell and the target. A beat note is formed, therefore, and this is amplified, and when it reaches sufficient intensity it sets off the fuse. This triggering intensity is adjusted so that it is obtained only when the shell is within lethal range of the target.

The great practical advantage of the fuse over the older types is that it relieves the gunner of the responsibility of fuse setting. His job is only to see that the shell passes within lethal range of the target. Provided that he does this, the fuse does the rest. Safety devices are included, of course, so that in the event of a miss the shell explodes before reaching the ground.

The idea of the proximity fuse was put forward as far back as 1940 by W. A. S. Butement and E. S. Shire, then of Air Defence Research and Development Establishment (A.D.R.D.E.). Early research was carried out in England at a Ministry of Supply establishment. Full information was given to the U.S.A., and it was eventually agreed that the main production would be in that country. In fact, all proximity fuses used in the war were of American manufacture.

It was the general adoption of the fuses in August, 1944, which caused the spectacular increase in the number of flying bombs shot down.

—Wireless World (Eng.).

Fisherman's Radar

Science has a new device to make fishing easy and cause no end of trouble for the wisest of fish. It is "fisherman's radar."

Just like wartime radar that detected enemy planes or submarines, this device sneaks up on a school of fish and flashes their whereabouts on a graph. It was demonstrated recently in Long Island Sound near New York City.

The recorder resembles a box from the outside, with a graph on its face. A mechanical stylus prints a map of the ocean floor as it is put into operation. Bumps and holes in the ocean floor appear at levels measured in feet or fathoms.

Between the sea floor drawing and a top line six feet below water level, fish are charted. The top line indicates where the little box is fastened to the hull of the boat.

The only thing the device can't do is actually catch fish.

Atomic Energy for Airplanes

Dr. Gerald Wendt, New York research chemist and science writer, describes a method by which he says airplanes could be powered with atomic energy.

"Atomic fuel could be supplied in the form of fine wire" (of atomic explosive) on a spool which can be fed into the nozzle of a jet engine," he said in addressing a regional conference of the Committee for Economic Development recently in Los Angeles.

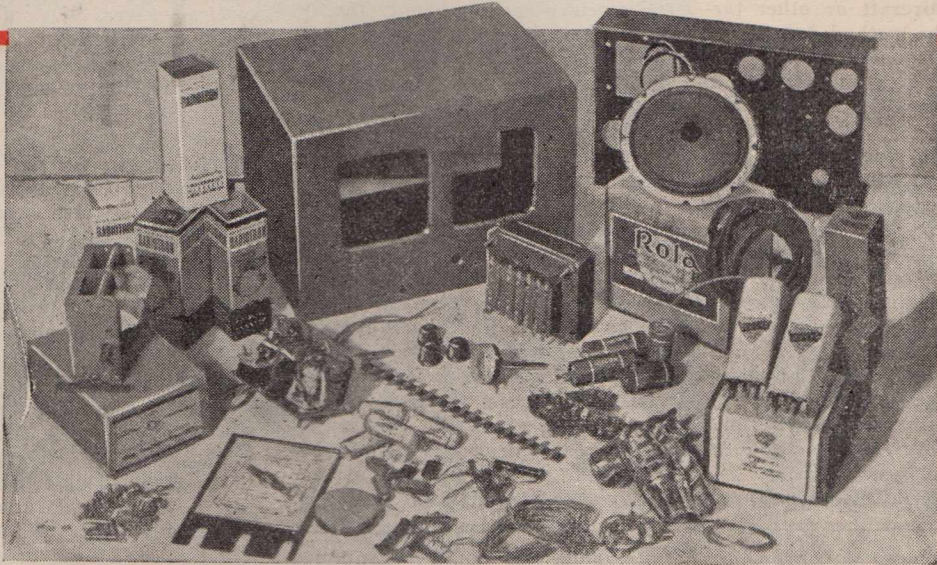
"If it disintegrates at controlled speed, all that is needed is a blast of compressed air over it," Dr. Wendt added. "Heated to several thousand degrees by atomic energy, this air would thus expand and roar out of the rear nozzle, just as gasoline flame does now.

"Once that is accomplished, the same hot air blast could be blown on a turbine wheel to operate the propellers of a plane or ship or to propel a locomotive or run any engine."

But the day before in Kansas City, Benjamin Miller, of New York, consulting engineer of the Midwest Research Institute of Kansas City, discounted the idea that atomic energy might supplant gas for power at any time in the near future.

"So far," he said, "atomic power has shown no use except for heat. I would say that it will not be developed within the near future."

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50-WATT PHONE TRANSMITTER

Well-designed circuit for ham use

FOR those who want guidance in the matter of a suitable circuit for a 50-watt "ham" transmitter we cannot at the moment do better than re-print the circuit of the Radiotron job which was fully detailed in our issue of April, 1938. This issue is now out of print and out of stock.

Features of this transmitter include an economical method of putting two power packs in series to obtain a suitable high tension supply of about 600 volts for the plate of the 809. This method means that ordinary receiver type power transformers are suitable, also ordinary electrolytic condensers with a voltage rating of 525 volts.

Crystal Oscillator

The first stage is a 6V6G, which is used either as a straight crystal oscillator or as a tritet doubler-oscillator, a switch being fitted in

the cathode circuit to provide a quick changeover from one to the other. For operation on the present 28 megacycle band a 40-metre crystal can be used in the tritet arrangement, taking off 20-metre drive for the 6P6, buffer, which can then be used as a re-doubler without circuit alteration, driving the 809 final on 10 metres. Although a 6P6 is shown in the buffer stage, the logical choice for this stage today will be the 807, which is readily available and will operate on exactly the same ratings as the old 6P6, which might be considered its forerunner. The 807 has an ample reserve of driving power for the 809, even when doubling.

For operation on 10 metres the final stage circuit will be quite suitable, the only precautions to be taken being in the matter of careful layout and use of polystyrene

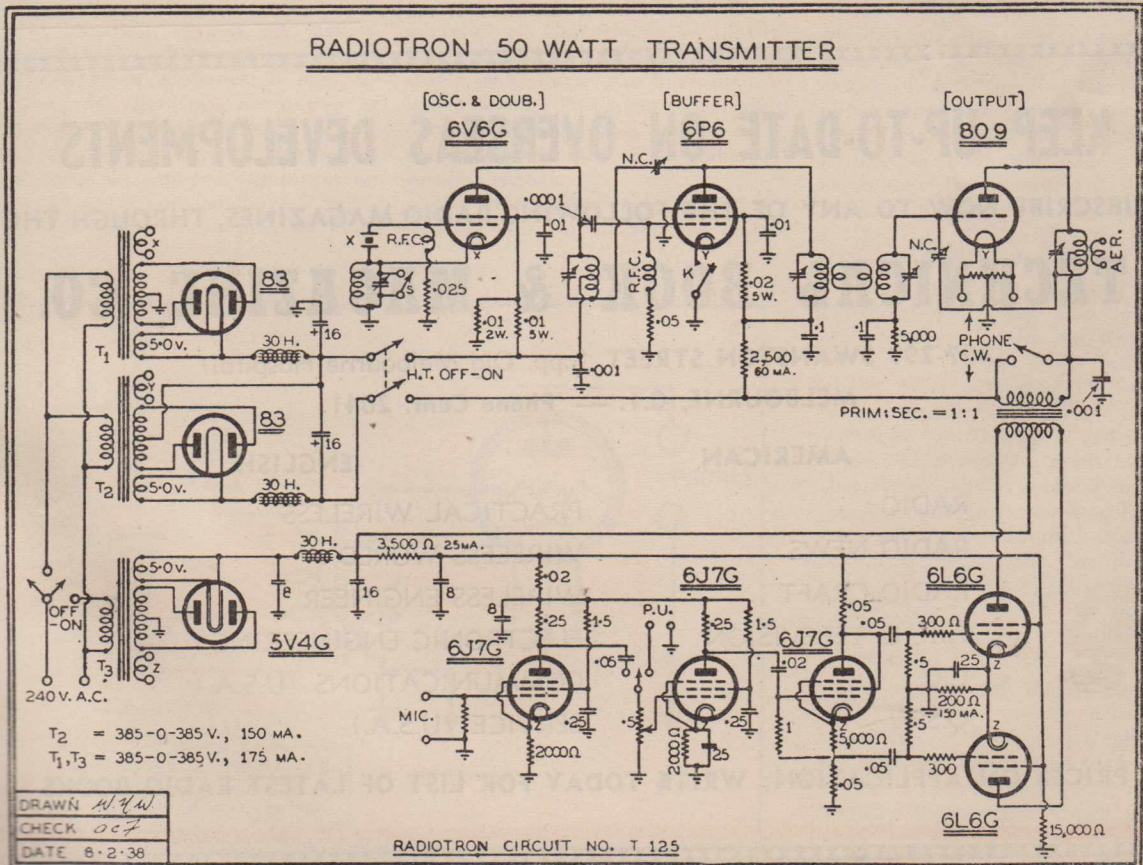
insulation to ensure efficiency at 10 metres.

The Modulator

The modulator circuit employs the concertina-type phase-changer, and, as it does not use any audio transformers, it should be particularly easy to avoid hum and feedback troubles, provided the whole unit is built into a suitable meat-safe type of amplifier cabinet, also fitted with a bottom cover. The 6L6 output valves may be replaced with the 807 type if preferred as these stand up to hard work better, but some care may be needed to avoid parasitics if long plate leads are left trailing about on their way up to the caps of the 807's.

With 807 type valves in the final, in fact also with the original 6L6G type valves, this modulator is cap-

(Continued on page 20)



TRANSMITTER

(Continued)

able of delivering a deal of power, and it is not safe to presume that over-modulation with it is impossible. Even if the undistorted power rating might be calculated to be 25 watts, there is no saying how much distorted power output can be obtained from it if you yell into the microphone hard enough! Over-modulation may get you fine DX results but it will get you into plenty of trouble with the radio inspectors and your nearby pals.

The Rectifiers

Specified in the circuit are a couple of 83 type rectifiers, and these may be hard* to buy at the moment. Type 80 or 5Y3G can be safely used instead. This may bring them to a loading a trifle higher in current than originally recommended by the maker, but we feel safe in saying that no trouble will occur on this account. In some of the American books these days they are giving the 80 some "unofficial" ratings of up to 600 volts at 200 milliamps when feeding into an inductance, as in this circuit.

Coil Data

Coil data was not given with the circuit, but can be taken from similar circuit arrangements featured in the American handbooks. A lot will depend on the size of formers available, etc. For the cathode coil of the 6V6G about 6 turns spread over $\frac{3}{4}$ of an inch will be needed if a 7 megacycle crystal is used. For the plate coil of the 6V6, tuning to 20 metres, about 10 turns of 18 or 20 gauge wire over about $1\frac{1}{2}$ inches will do for a start, and can then be adjusted experimentally to suit the condenser used. The plate of the 6P6 or 807 double will be tuned to 10 metres, so about 4 turns spread over $1\frac{1}{2}$ inches should be O.K. This should also serve for the 809 grid coil. Plate coil for the 809 will depend on the style of coil used, and whether wire or tubing is used. Enamelled copper wire of fairly heavy gauge seems to be best, and about 4 turns, $1\frac{1}{2}$ inches in diameter and $1\frac{1}{2}$ inches long, mounted on strips of polystyrene, but air-spaced, should be about the ideal.

For Guidance Only

On reading through this little story about the transmitter it may

appear that we are a little vague on several points. That is to be expected with transmitters. When describing the construction of receivers we sometimes go to great detail in order to give explicit instructions. That is necessary when sets are being built by novices. But with a transmitter the position is different. Transmitters may be built only by licensed radio experimenters who have, by examination, proved their working knowledge of transmitting practice. They will appreciate that any transmitter is designed, built and then worked upon to considerable lengths in order to get it operating to perfection. "Ironing out the bugs" was the expression often used by the late Ross Hull to denote the final adjustment of a "ham" transmitter.

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Crystals will not Amplify

An elementary explanation of why crystal sets have their limitation

HERE seems to be no way of suppressing the requests for crystal circuits to use another crystal as an amplifier or even a valve circuit to follow a crystal detector. For year after year we have been trying to explain why it is not practical to think along these lines, but still the queries pop in week after week. There seems to have been an especially heavy dose of such queries in the past few days, so it must be high time to again go into the many reasons why

By
A. G. HULL

a crystal receiver is a handy little gadget and a valve set has grand performance, but "never the twain shall meet."

The straight crystal set has a fundamental advantage over all other types of receivers; it uses no valves and therefore no power is required. A crystal set can be installed and left running for years and costs not a penny for power or replacement. You can have a crystal set installed in the head of your

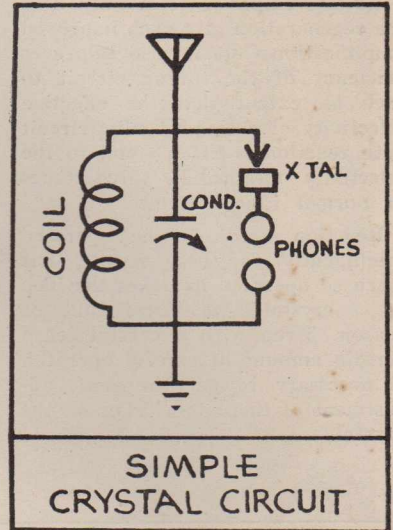
bed with a phone under pillow and soothe (?) yourself to sleep to the strains of boogie-woogie, without having to switch off the power after you have fallen asleep.

Two Drawbacks

Two major drawbacks are also features of crystal sets, lack of selectivity and lack of sufficient power to drive a loud-speaker. With a valve set the signal picked up by the aerial is used to control the power flowing through a valve, just like having a single finger to pull the trigger, which releases the power in the shell of a gun. With a crystal set the actual power picked up in the aerial is all we have to drive the phones.

The problem of selectivity is not really difficult, for even in the worst locations it is usually possible to get at least one signal solid enough to override all the others; so that so long as you are satisfied with this single programme you have little to worry about. To expect to get eight or nine stations on a crystal set is to be greedy, and disappointment usually ensues.

The selectivity of a crystal set can be improved by the use of two



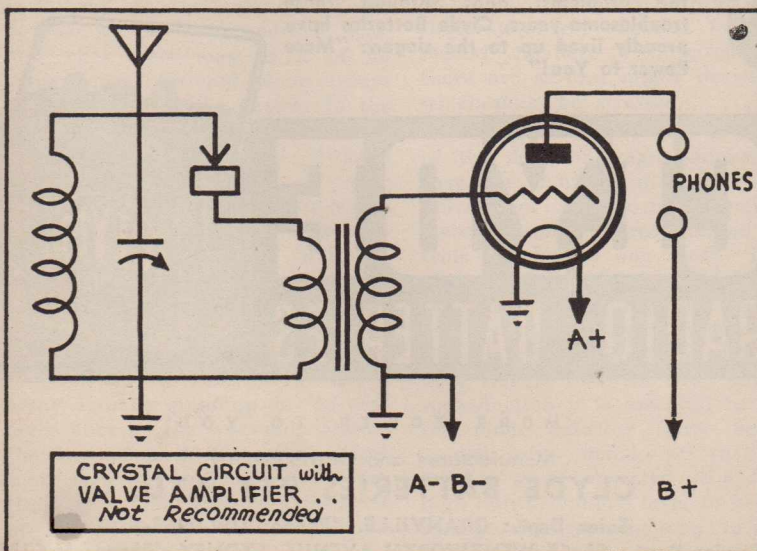
coupled circuits, or a band-pass arrangement, but this is certain to cause a loss of some of the precious power received in the aerial, of which there is so little which can be lost without the music in the headphone fading below a level of reasonable audibility.

Adding a Valve

The above facts seem to be fully appreciated by those who build and operate crystal sets, but once they get good results from the headphone their minds start to think along the lines of "how nice it would be to add a valve and amplify these headphone signals so that they could drive a loud-speaker." At first glance it appears to be a reasonable expectation, but in practice it is found that the performance of a crystal-plus-valve set cannot compare with the performance obtainable from a single-valve set without a crystal.

The reason for this is explained with the one magic word—"regeneration." With the single-valve set it is possible to feed back a portion of the amplified signal and re-amplify it countless times until it

(Continued on next page)

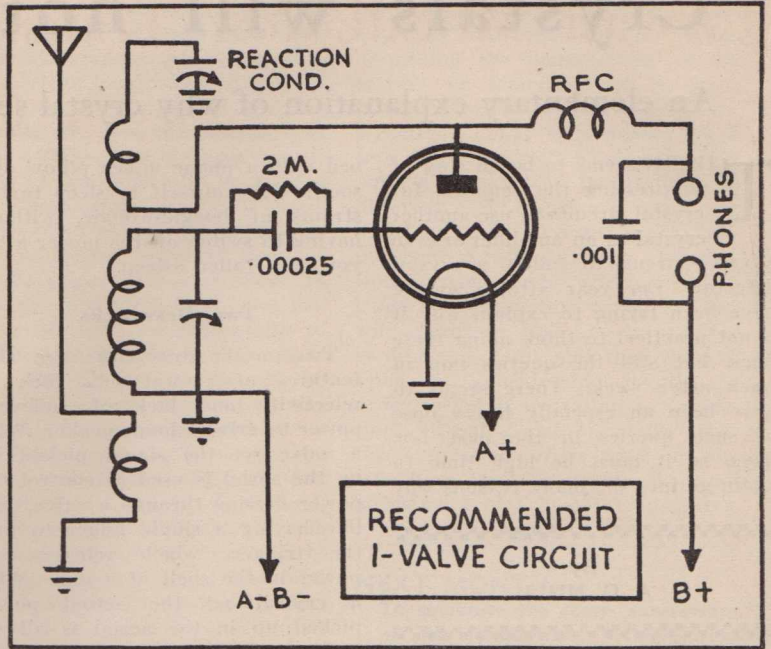


CRYSTALS

(Continued)

builds up to a signal far beyond what might be expected from the amplification factor of the valve as a normal amplifier. Not only does the regeneration give such improved amplification, but it also improves efficiency of the tuning circuit to such an extent that the effective selectivity of a single tuning circuit with reaction is often equal to the selectivity obtained by three stages of normal tuned circuits.

Reaction needs to be operated intelligently for best results, but when so operated it makes the idea of a crystal-valve circuit out of reason. Even with a crystal set a certain amount of careful operation is necessary to get the right adjustment of the cats-whisker on the crystal.



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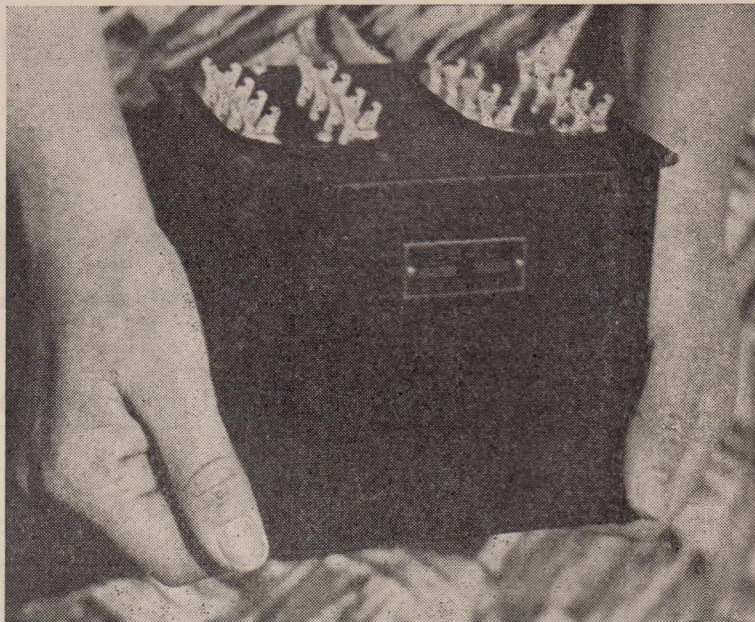
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30-watt Modulation Transformer for Hams

Those who are building or re-building their experimental transmitters will be happy to know that their interests are being well watched by the Trimax Transformer people. So far the rush of commercial orders has the production just about booked up, but in a month or two the Trimax modulation transformer should be available for delivery. Based on a design which was so popular before the war, the new transformer has sixteen terminals, which can be connected in so many ways that it is possible to get almost any matching of impedances. To be exact, there are fifteen possible primary loadings, ranging from 18,000 to 2,500 ohms, and some hundreds of secondary loadings ranging from 26,000 to 208 ohms. It is even possible to use the modulation transformer to feed into a 500-ohm line instead of the transmitter! The transformer is a quality job in every way, with lots of copper and iron, sectionised windings and an ample frequency response, yet sells for a figure well within the reach of the amateur's pocket.



The Trimax 30-watt modulation transformer, type TA907, weighs about 18 lbs. Note rows of terminal tapings.

AERIALS

(Continued from page 6)

Mc/s linked by co-ax. cable to this array, a remarkable amount of R.F. is "piped" to the antenna. There appears to be no measurable loss, and what there may be is of no consequence. Ground plane arrays of this type are the answer to the feedline loss problem, and the efficiency over the usual "twisted pair lamp-cord" dipole is very marked. Within reason, little seems to be gained by erecting the ground-plane at extreme height. Main requirement appears to be that of getting in the "clear." Tests at the writer's station actually show little difference in reported signal strength at 70 miles between the array actually standing on the concrete floor of the workshop and at the top of a 30-foot pole. Here there is a fine antenna answer for the V.H.F. Ham with co-axial cable of the 50 to 70 ohms impedance variety on hand.

—DON (VK2NO).

MY OWN

(Continued from page 15)

Results were up to expectations and those who have heard this set have immediately remarked, "Why not run the circuit in the Radio World for the benefit of those who want something extraordinary in the way of reproduction from the locals?" So here is the circuit, but there are several minor drawbacks which must be stressed.

As will be seen from the circuit of the detector stage, there is no easy way of fitting an audio volume unless you can procure a pair of matched and balanced volume controls coupled to one shaft. These are mighty hard to get and so it practically boils down to having to use a volume control working on the r.f. stages only. The difficulty with this is that for best possible reproduction it is essential to have the diode detector fairly heavily loaded with signal, so that the set has to be operated at a fairly high output volume level to get the best possible reproduction. In practice this is not as noticeable as might be expected.

Two other drawbacks must be pointed out, too. The difficulty of embodying automatic volume control and of using the audio end as an amplifier for gramophone records. You will agree that all these drawbacks do amount to something, yet I still feel that the set has much to commend it. The reproduction is infinitely superior to that obtained with ordinary sets, and certainly shows up the difference in the quality of the broadcasting from different stations.

The tuner portion of the set is unconventional, in that an r.f. stage is used ahead of the converter valve, yet there is no i.f. amplifier. A special wide-band i.f. transformer, using a tertiary winding for coupling, is used to couple the converter valve into the diode detector. This allows a wide-band of frequencies to be handled, yet still allows ample selectivity to separate all the local stations. These i.f. transformers were originally introduced in the Britannic line, and it is one of the old Britannics which I have in my set, but a similar transformer is now readily available in the Aegis brand, and possibly others.

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Dismal Future for the Radio Trade

A forecast by one of our readers

IT is the general policy of "Radio World" to look on the bright side of everything, but this does not always please all of our readers. So, to be quite fair and impartial, we find that from time to time we publish expressions of other people's views, even if they are 180 degrees out of phase with our own.

The following is a typical case of this kind. In order to do justice to a reader of many year's standing, and a staunch follower of "Radio World," we are going to publish his sad forecast of the unfortunate future in store for those who depend on radio for their bread and butter.

The Letter

Writing from Church Street, Carlingford, Mr. N. Torr says: "While agreeing with a lot you say, I can't see the wonderfully bright prospects for the radio trade which you mention from time to time. In view of the thousands of ex-servicemen who will be joining the trade during the next twelve months, I feel that there is every reason to be apprehensive. No doubt the parts manufacturers will be O.K. But I am thinking of the individual retailer-serviceman. Consider these points: (1) Existing civilian radio servicemen were able to keep all (for practical purposes) receivers in satisfactory condition, even though many were only part-time employed in this work; (2) they managed this even in the face of petrol rationing, parts shortages and a restricted range of available tapering off, many part-time civilian radiomen will turn to radio for a full-time job; (4) on the manufacturing side, it is admitted that the trade has a capacity of eight times its pre-war production rate with existing staff and personnel. With the completion of "service" orders it is likely that many of these factory employees will be dispensed with, and a proportion of these will no doubt also turn to running their own radio business as a means of earning a living.

Perhaps I am a pessimist, but it is significant that the Australian Institution of Radio Engineers is not very optimistic either. To quote just one sentence from the August issue of their proceedings: "The

tens of thousands of electronically-trained servicemen will not all be able to enter, or possibly re-enter, the industry, as it is fairly well saturated now."

Youthful Optimism

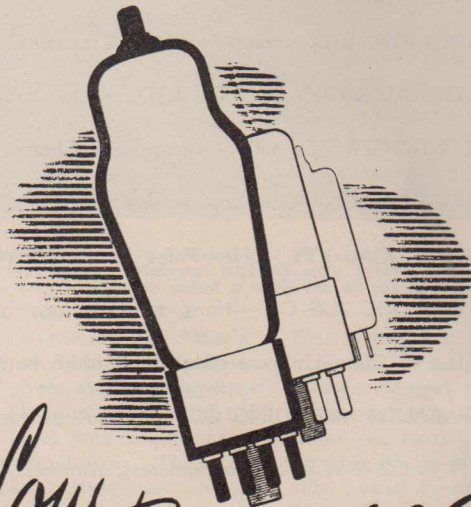
Your editorial in the November issue will, no doubt, give some prospective traders "furiously to think," but many, with youthful optimism, will pass over it. Hence I suggest that you again stress the sober side of future prospects in a coming issue.

A bunch of disillusioned ex-servicemen, in a year or two, will

not help any section of the radio industry.

Excellent Profits

The excellent profits from maintenance work (if any) made during the war years were no doubt due to the fact that the public were educated to expect shortages and consequent high prices and charges. With a return to normal conditions, I suggest that the public will expect lower charges, hence lower profits for the individual traders, even without the cutthroat competition that a saturated profession may create.



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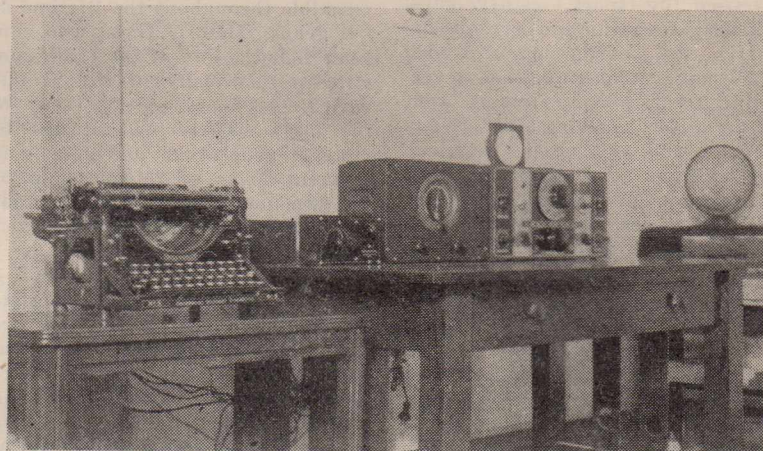
CALLING CQ!

By Don Knock, VK2NO

BARGAINS FOR HAMS

Being of necessity a Sydneyite (and I don't mean that disparagingly) I don't know how the gang fare in other capital cities for bargains in ex-Service radio gear, but VK2's in and around Sydney have, of recent weeks, had access to a wealth of useful equipment. If, for example, anybody had told me in 1941-42, as an Army radio instructor, that in the short space of four years' time, I would see in shop windows 109 set transmitters for £3, the receivers for £2, and power units for thirty bob, I would have laughed such an informant to scorn. But such is the situation, and now I think ironically of the days when my students meticulously "checked stores" after exercise before returning to the watchful eye of the R.Q.M.S.!

This is an era of fantastic bargains for the radio constructor but singularly absent in the flood of ex-Service gear are receivers of the communication class. I hear whispers that VK4's haven't done too badly, but if any SX28's, H.R.O.'s, HQ120X's and the like ever reached Sydney, they must have "atomised." Nevertheless, the city VK2 has had



The well-equipped shortwave listening-post of Robert C. Kramer at Plainfield, Ill., U.S.A. The receiver is a National NC100X with 3-valve pre-selector. A doublet-type aerial is used for all reception.

some pretty attractions at "Mac's" in the heart of Sydney. It paid to be in early even at the "sixpenny dip." Quite obviously many did not realise just what was being passed over in many instances. Those ex-Admiralty radar time-base chasses—massive affairs in cast aluminium—had to be seen to be believed—for £1. Full of the highest-grade components, they must have cost the

British taxpayer dearly, and a point to remember—Navy components are always marked for modest ratings, when obviously they will stand three times the load. Your scribe picked up (for 2/-) a 240-volt 500-volt per side power transformer marked 75 M.A. It doesn't even warm up at 250 mills loading!

What looked like a battered variable condenser of queer design, I recognised at once as a "butterfly" V-H-F tuner somebody might have dropped the kitchen sink upon. But for 6d.—it was worth the disassembling and straightening of rotor and stator plates. After re-assembly (not at all easy), the result is, with a 955 on the job—a V.H.F. sig. generator running from 80 Mc/s to around 500 Mc/s. No, brother—don't ask me; I don't know of any more.

My advice to the Ham is to think twice before passing up Disposals gear if the price is ridiculously cheap. If you have the slightest idea that any "bit or piece" might be useful some day, it's worth the expenditure, for, in future days,

(Continued on next page)

A Full-Time Job for R.I.

Spare a thought for the Wireless Branch, P.M.G.'s Department, you who bemoan any delay in re-issuing licences. I'm told that the staff responsible for amateur affairs, from R.I. Peter Dunne to his stenogs, is snowed under with paper resulting from applications galore. It's a full-sized job re-issuing pre-war licences, so what it will be like when that part is cleaned up, and the thousands of applications for new licences are attended to, can be imagined. My guess is that there are more aspirants for A.O.C.P.'s and more potential Hams in the

offing than may be realised. Another thing, those who know what an indifferent deal the amateur gets in some countries are aware that the VK is quite a favoured person by comparison—even if he hasn't yet obtained access to his pre-war DX bands. That's not the fault of the licensing authority, who would make the bands available without delay if they should be disgorged by those who "own" them at present. It's a safe bet that VK's will get as good a deal on the DX bands as most countries when the time comes.

HAM NOTES

(Continued)

this golden era of radio parts at prices so low as to be unbelievable will pass and be but a memory. Wars come and go—likewise in due course their aftermath.

* * *

During the "first war to end wars" amateurs of pioneer days formed the backbone of signals as practised by spark, rotary gaps, balanced carborundum crystal detectors, and "earth current trench sets"—not forgetting the ever-useful "Fullerphone." Hams went to sea with "crashing 5kW. Navy sparks," and even took "one-inch sterling spark coils" aloft with them in open cockpits of DH4's and the like. After the shindy ceased, the fledgling radio industry got under way, keeping pace with broadcasting development. Radio amateurs were again well in the picture.

Some ran B.B.C. stations and the like, and when they should have been sleeping, ran their own rigs. This "second war to end wars" brought the Ham into even greater

prominence. Scattered through fighting services—and in factories—Radar—everything where there was radio—**there** was the radio amateur.

He was often submerged in professional status, but at heart he was yearning for the day when he could turn to his scientific hobby. There is always **some** kind of a "kick" to be got out of amateur radio, and the lure remains almost irresistible throughout the lifetime of the genus "Ham." Those who consider that the day of the radio constructor—especially of the "Ham" variety—is done—are far wide of the mark. There will always be younger generations and man is an inherent lover of things made by his own hands—and communication with his fellow man by his own puny efforts.

* * *

If the service big-wigs responsible for Australian communications are serious about the need for retention of our 20, 40 and 80 metre bands, VK's are equally serious in contending that the service claim is greatly over-rated. The W.I.A.

HAM SENTIMENT

Pre-war three-letter calls were issued to VK2's owing to total expenditure of two-letter calls, and, despite the fact that probably in the interests of brevity, most preferred even a re-allocated two-letter call, others are keen to get the pre-war allocation back. I don't recall that the VK3 list was so completely used up as to warrant an additional letter, but I note with interest a brand new VK3—ex-VK2 on "Ten" with a VK3 three-letter call embodying the old N.S.W. letters. Perhaps after all, there is DX quality attached to a long-established letter combination. There is also a certain amount of rabid Ham sentiment.

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would do well to organise member check-up on "frequency-marking" transmissions in which a lot of irrelevant chatter goes on under the

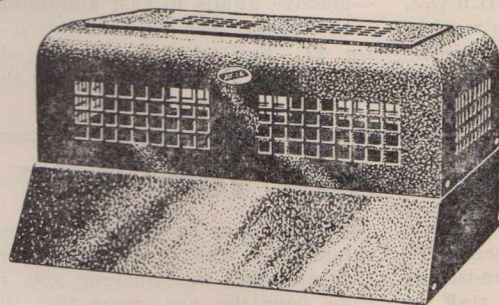
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guise of service traffic. Two stations near the L.F. end of 14 Mc/s indulge for lengthy periods with banter between Nola and Alice (and I don't mean code-names) with such remarks as "Hi ya, mug—how are the kids?"—and lots more in this strain. Perhaps the operators are bored or "browned off," but we see no reason why amateur bands should be retained by the services for this purpose.

* * *
T'other night, March 17th, I logged an R6 phone on "Ten" at 9.30 p.m. "Calling CQ Twenty—W8UXE, Admiralty Islands." Being of a curious nature, I popped on the Philips R163 communication receiver—and, sure enough, there he was, on his 20m. fundamental, but only R3. In this case his harmonic was reaching here in better style, and there's nothing unusual in that. Listen to the harmonics of American broadcasters around 37-40 Mc/s from their 18.7 Mc/s operating frequency. They are often R9.

* * *
Most noticeable lately around Sydney has been the ripple modulation on local ten-metre transmissions caused by passing aircraft. On several occasions other stations report almost complete chopping of the carrier on phone transmissions due to out-of-phase arrival of reflected radiation. Cause, of course, is well known: the speed of the plane as it moves toward or away from the station, being responsible for the Doppler effect. From such phenomena was born the wartime achievement of the A.A. proximity fused shell.

* * *
During a phone contact with "Ken," G6CU/ZC2, on Cocos Island in mid-Indian Ocean (28 Mc/s), I asked him how he fares for G contacts. His reply was that "there are literally thousands of them, all queued up waiting to contact him,"

WHERE THERE'S SMOKE!

Overheard in Sydney on 28 Mc/s the other night: One of our leading "bug" key men—to the effect below: "Will QRT now as shack full of smoke from tranny!" Obviously a sound enough reason to pull the switches—in a hurry.

LOTS OF ACTIVITY ON "TEN"

Activity on "Ten" is now on the increase, and as more and more licences are issued the population there shows additions almost daily. Opinions are varied as to the attractions of this frequency region, but nobody can deny that the band has not been at all selfish; it has yielded a fair issue of DX.

Newcomers

Newcomers to "Ten" and they are most of those on the air, are at least fortunate that ionosphere conditions and predictions are such that the band "opens" for lengthy periods instead of exhibiting oyster-like behaviour such as many old hands remember in the early 1930's.

Tom, Dick and Harry, with their 50 watts input and careful attention to antenna properties, are able to work DX for hours upon end on "Ten" just now.

There have been periods when the band opened with remarkable full-strength signals for one or two hours with such intensity that cross-Pacific stations were much stronger than nearby locals. Some K7's in Alaska have been heard strongly on

and he showed surprise that G signals should be difficult for Australia. So they are here in the East, but the Westralians enjoy easy QSO's with England and South Africa.

* * *
During a yarn on phone (on "Ten," of course) with W3DMH/K6 at Oahu Naval Radio Station on Sunday, March 24th, he told me of QRM on my sigs, "particularly from a ZL2 calling CQ on C.W." As this is written, I haven't heard of Maorilanders using "Ten" yet, but it seems time they were. Being confined to purely local contacts on the static-ridden "80-metre" phone allocation must be a bit galling for a summertime form of relaxation. Not that "80" isn't a most desirable band—for winter working. Here in Sydney it is a barrage of machine-gun QRN. But, brethren—is that any worse than car ignition on "Ten"? That restriction on ZL's not being permitted to work DX (on 80) must have been a setback to the VK9 (Army station—

phone, and I understand that at least one South African has been heard and worked in Sydney. On Sunday afternoon, 24th February last, conditions were extra favourable between VK3 and Z and held up those between 4 and 6 p.m. So strong were signals that Victorians were heard complaining about QRM on DX caused by VK2's. This DX-chasing business is understandable—I was once a DX fanatic myself, but in pioneer days; and I enjoy a yarn with a fellow Ham overseas. I do **not**, however, enjoy the breathless get-it-over-quick brand of DX QSO (engendered, perhaps, by typically patchy 28 Mc/s conditions) with the usual TNX FOR QSO OM, PSE QSL, 73's ES CUL, etc., and lib! Nothing is **achieved** by such contacts.

Interesting Chats

Much better do I enjoy a leisurely chat with another VK—about mutual interests in experimental radio work, local or interstate, but, of course, "Ten" never yields the latter for long. Too often the other man disappears almost in the midst of a syllable.

Ham-manned), who landed among ZL's with a 500-watt stentorian voice—and was ignored by them! They could be heard talking among themselves about the "intruder"!

* * *
During tests on 50 Mc/s phone I had occasion to try several antenna systems, but all using coaxial feedline. Whilst pondering over things in the shack and in QSO with VK2LZ (Blue Mountains), I noticed that by placing my hand across the D.P.D.T. antenna changeover switch, his signal rose about 2 points. Obviously introduction of the spaced type of switch in the line had caused considerable variation in impedance. Some planning with pencil and paper and a little jiggery-pokery at the workbench resulted in evolution of a coaxial changeover switch which is virtually a D.P.D.T. arrangement but retains the low impedance line characteristic. It is made from ex-Disposal odds and ends. If readers are sufficiently interested, it will be described in the near future.

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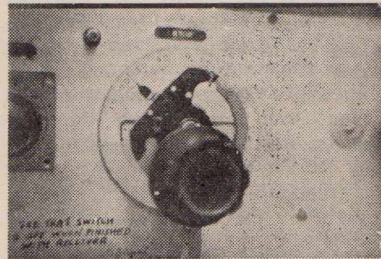
Can't quite get the habit of calling the new 50/54 Mc/s band 6 metres, as there is a tendency to speak, by force of habit, of "Five." In the Sydney area the band has yet a limited population, mainly, I suppose, because of DX attractions on "Ten." Those consistently in occupation are VK's 2WJ, 2ABZ, 2LS, 2LZ and 2NO. Some of the "Ten" metre men have receivers on "Six" but limited activity there no doubt deters the establishment of transmitters. Post-war activity is yet in its infancy, and time will tell. Outstanding example of what can be done on "Six" with low power is VK2LZ, located 60 odd miles distant, at Wentworth Falls. His phone is R7 with 3 watts input to an unusual TX line-up. Crystal stage is an 1852 Tritet quadrupling in the output, followed by an 832. Con doesn't use that 832 as intended by the makers. First section of it serves as a doubler, and second as a "Telefunken" modulated P.A. In addition to that, the microphone is a fighter pilot's "laryngaphone"—a throat contact type. VK2LZ plans to increase power substantially and also has ideas about 170 Mc/s.

During the general meeting of W.I.A. (N.S.W.) on March 22nd, one agenda item for the forthcoming Convention dealt with inauguration of a trophy for 50 Mc/s DX. There are a few non-progressive people who can see only facetiousness in such a proposal, but ideas that DX will not break on "Six" are likely to be laughed to scorn during the next three years. Radio physicists say that the largest crop of sunspots in history will show up,

EX-VK NOW A "G"

Bruce Glassop (VK2BG) tells me that ex-VK2OR (Wing Commander Maurice Brown), now in G-land, has acquired a G call. It is G2YP and he is now active on "Ten" and looking for home contacts. His frequency is 28005 Kc/s and likely periods will be at the week-ends. O.K., Maurice, the intention is good at both ends, but how willing will the "potty" band be? Lots of us here in VK would like to QSO G's, but it looks as if the band is mostly "agin" it.

and that V.H.F.'s will exhibit DX behaviour. True, it will be spasmodic, and perhaps highly erratic, but what of that—the 100 per cent. Ham is always intrigued by the unusual. Which reminds me—if and when the atom bomb rajahs decide to make that big upheaval at Bikini Atoll, observations at V-H-F's



Idea for a bandsetter control for an amateur band receiver. The dial is a re-doctored, early-day, front-of-panel type; not very elegant but quite useful.

might be of interest. Personally, I hope the test is scotched, as I have more time for the four-footed dumb sufferers than the so-called "humans" responsible for these things.

VK5's and 3's are reported to be active on 50 Mc/s, but numbers are as yet limited. If any DX does materialise on this band, it will only be by reasons of occupancy by large numbers of stations, or by pre-arrangement. The remarkable DX tendencies of "Ten" would not have been known but for the fact that thousands of stations in world-wide locations have been literally forced to use the band.

—VK2NO.

One of the most interesting Pacific 28 Mc/s phones is W9WUG/KB6, on Guam. This station is one of the U.S. 20th Air Force Amateur Radio Association and sports quite an array of Ops. They are: W's 3AIM, 3DLA, 5CQ, 5ENH, 5GAB, 5GVR, 8UFH, 9EDS, 9LEI and 9WUG. Their "hands" are: Mel, Bernie, Ray, Hy, Jack, Sam, Rudy, Bill, Lou and Oak. My own QSO was with the latter and he tells me that QSL's to H.Q. 20th Air Force, A.P.O. 234, will reach them.

—DON (VK2NO)

Shortwave Review

CONDUCTED BY

L. J. KEAST

NOTES FROM MY DIARY

S.O.S.

With the approach of winter, listening conditions will alter and those whose avocation permits them to tune-in during the daytime will find signals from overseas excellent, whilst those poor city sloggers whose listening must be done at night will perhaps be disappointed with the poor signals.

I would therefore be glad to receive reports from the daytime tuners. I often think a great number of our readers hesitate to send in reports, believing that they may be considered of no interest as only regulars have been heard. We want reports on those chaps, too, as it is just possible you may have heard a reference to change in schedule or frequency. There will be a lot as winter comes and, as I hope to prepare for the May issue a complete schedule list, you can help in this big job considerably. Will you? Of course you will, and I offer my anticipatory thanks.

Colourful Opposition

As if sun spots and morse were not sufficient to bring many a curse from an ardent listener when trying to log that "weak-sister," we now have the Aurora Borealis and the Aurora Australis to tax our patience. I guess many a Dx-er figured one of the valves had gone phut when trying to tune on the 26th and 27th of March. When, as the Press tells us, signals from the U.S.A. to the BBC were poor, radio messages from London to Sydney

were delayed, etc., etc., we can be forgiven for pulling the big switch.

The Mutiny of the Bounty

The visit of the Duke and Duchess of Gloucester to Norfolk Island and the subsequent broadcast of their welcome and the various speeches reminded me that a good many of the inhabitants of Norfolk Island are descendants of Fletcher Christian and Edward Young, of Pitcairn Island. One of my most treasured verification cards is from Andrew C. Young, VR6AY, Pitcairn Island, received a few years ago.

Pitcairn Island was settled in 1789 by a small band of Englishmen of H.M.S. Bounty. Headed by Fletcher Christian and assisted by Edward Young, the small colony grew and prospered. Today, there are about 200 inhabitants, most of whom can trace their lineage to the nine original English settlers.

The island is about two miles long and a mile wide, with lofty cliffs of a thousand feet rising from the water's edge. Along the slopes, on small plantations, pineapples, lemons and semi-tropical fruits are grown. These fruits are a means of barter with passing ships to secure supplies.

"Universalite"

As most Dx-ers know, I am the representative for Oceania of the Universal Radio DX Club, 7507 Holly St., Oakland 3, California. Several are now members of this, probably the biggest radio club in America, and have expressed de-

light at the great amount of information contained in the club's paper, "Universalite." Membership and 19 issues for the year costs 12/6. I have one or two further applications in hand and will wait until this issue reaches our readers in case any more desire to join. Send postal note for 12/6 to me at Ermington and I will endeavour to get permission to forward the money to U.S.A.

New Address

Will reporters please note my address is now:

L. J. KEAST
3 Fitzgerald Road
Ermington
N.S.W.

Removal of 'phone has been applied for and if the number is known before going to press, will be shown in Stop Press.

Spain

This country is well in the news at present, so a list of most of the stations known to be operating in that troubled land will not be amiss. It does not follow that all are audible here but most of them are worth trying:

EAQ, Madrid, 9.86mc, 30.43m: This old-timer is now heard on code only.

Radio Nacional De Espana, 9.37 mc, 32.02m: 5-6 p.m.; 10 p.m.-midnight; 1-6.30 a.m.; 6.45-8 a.m.; 9.30 a.m.-12.15 p.m. News in English at 6.45 and 11 a.m.

ULTIMATE

Champion Radio

Sole Australian Concessionaires:

GEORGE BROWN & CO. PTY. LTD.

267 Clarence Street, Sydney

Victorian Distributors: J. H. MAGRATH PTY. LTD., 208 Little Lonsdale Street
Melbourne

The Ultimate factory has made the changeover from wartime production. Designs for the new models are now completed and production is about to commence.

These models should be available early in 1946 — they will be worth waiting for. Watch for further announcements.

SERVICE: Servicing of all kinds of radio sets, amplifiers and Rola speakers will continue to be available.

—, Madrid, 9.32mc, 32.2m: News in English at 6 a.m.

Radio Falange, Alicante, 7.951mc, 37.73m: 4.30-6.30 p.m.; 5.30-8 a.m. (This station is generally known as 7.941mc, but measured frequency is 7.951mc.)

EC22, Oveido, 7.13mc, 42.05m: 8-8.30 a.m.

Radio S.E.U., Madrid, 7.107mc, 42.21m: 7.30-10.25 a.m. (Note: Has moved from 7.135mc.—L.J.K.)

Radio Malaga, Malaga, 7.05mc, 42.55m: 11 p.m.-1.30 a.m.; 6.30-10 a.m.

FET-15, Cordova, 7.042mc, 42.61 m: 5-7 a.m.

EAJ-3, Valencia, 7.035mc, 42.61 m: 5-9.25 a.m.

EAJ-9, Malaga, 7.022mc, 42.72m: 5-9 a.m.

—, Valladolid, 7.003mc, 42.85m: 3-9 a.m.

FET-1, Valladolid, 3.658mc, 82.01 m: 5.30-7.30 p.m.; 10-11 p.m.

This is the list according to my records, but does not, of course, include Spanish Morocco or Canary Isles stations. If reporters can improve or correct the above, please let me have your notes.—L.J.K.

SAYS WHO ?

Elsewhere in this issue will be found a complete list of the Australian shortwave stations, together with latest schedules which I trust will remain correct until received by our ever-growing overseas subscribers.—L.J.K.

VLR-2, Melbourne, splendid station a.m. and p.m. All the 19-metre Australians put in wonderful signals. Remarkable band to be so fine at so many different hours, day and night.—Gaden.

Sgt. Bill Brundiage, who for so long gave the "Sports' Page" over the Armed Forces Radio Service, has now been discharged and is back with his old station, WOL, Washington, D.C.—L.J.K.

"Conditions here have been quite good and I am rather pleased with the results I have achieved up to date from my new set, and trust as time goes on I will have more to report that will be of help in compiling the matter for your good paper."—Miss Sanderson. (I'm only sorry that pressure on space prevents me from using all the splendid material provided in Miss Sanderson's excellently compiled report. Commencing a year or so

ago with a modern 4-valve mantel set, she is now the justifiably proud possessor of a six-valve receiver and it certainly combs the ether.—L.J.K.)

A. E. (Ernie) Moore, of New Farm, Brisbane, says: "Am also hearing quite a few Central and South American Hams on 20-metre band from as early as 2.30 p.m. till between 5 and 6 o'clock. However, most of them are in Spanish but some have been heard in English. The other day OA4M in Lima, Peru, was putting in a "wow" of a signal. I copied him and have sent on a report. Wish more would give the town like he did. Have also copied TI2OA in Costa Rica, who likewise has a fine signal."

The U.S. Government, Department of State (OIC) International Broadcasting Division now uses KWIX, 11.89mc, and KWID, 9.57 mc, in programmes to New Zealand from 5.15-6.15 p.m.—L.J.K.

"Latest veries here include Radio Macassar; Berne, 25.61m; Accra, ZOY, 41.12; and LRX, 31.12m (though the card shows 31.06). Others in relay are LRI, 1070kc, and LRX-1, 6120kc. QRA is Radio El Mundo, Calle Maipu 555, Buenos Aires. Heard them September 28th, 1945.—Suffolk.

"With call letters similar, if not the same, as XNCR, a station on about 7.05mc appeared to close at 8.50 p.m.—Gillett.

GSG, London, 17.79mc, is now used in transmission to New Zealand and Pacific Area from 5.30-8 p.m., but note that from 14th April Pacific Service closes at 7 p.m.—L.J.K.

"KGT-7, Los Angeles, 10.01mc, heard weakly at 11 p.m., contacting WLXJ in Shanghai. KGI-5, same location, 7.625mc, heard signing off with JVI, Tokyo, at 11.40 p.m.—Gillett.

NEW STATIONS

KCBR, San Francisco, 15.33mc, 19.57m: This new frequency for the C.B.S. is excellent in the afternoon with news at 2 p.m. Sports news is given at 2.05 and news at dictation speed at 2.30. I am not quite sure of schedule but it opens at 7 a.m. and I think closes at 4 o'clock. The programme is beamed to Japan, Korea, Philippines, South East Asia and India.—L.J.K.

Athens, 7.295mc, 41.13m: This is believed to be the station first reported by Ern Suffolk in January as ZOY, Accra. Has been heard testing in the

"Only decent veries are the flash CHTA card and WNRE for 19 and 48 metre bands. A new type KWID/KWIX with big letters; new type to me."—Gaden.

"Another mystery here is a French one on somewhere near 6.90 mc, closing at 7.20 a.m., with the 'Marseillaise.' — Suffolk. (Maybe this is Dakar on 6.917mc, closing at about 7.25 a.m.—L.J.K.)

"A mystery on 17.845mc, 16.81m, with French and Flemish language and light music opens very weakly at 9 p.m. and off at 10.30. Thought it may have been Paris, as they are on that wavelength at 1 a.m. with R8 signals, in French, relaying 19.68m and 19.84m. However, the 17.845mc at 9 p.m. has proved itself not to be Paris, as the usual bugles are not played nor is the 'Marseillaise.' Instead a gong signal is played. Thought I had them set for identification recently when they were coming in better than usual—R 3-4 at just prior to sign-off. Could have sworn loudly at 10.30 when the QRM morse alongside it spread all over the station. All I got was, 'Radio —?'—Suffolk.

"KU5G, Guam, asking for reports from listeners anywhere. Address: Public Information Service, Guam, Mariannas.—Hepburn.

"I heard the United Network on 19-metre band asking for reports at 3.30 p.m. but the announcer did not give any call-sign.—Hepburn. (I have no record of United Network on 19 metres at that hour but KCBF, 9.75mc, and KCBA, 6.17mc, are on till 4 o'clock. However, Mr. Hepburn, mail from the U.S.A. is all haywire and the latest United Network list I have is for December and that did not arrive till 21st February.—L.J.K.)

mornings from 6 o'clock, signing off at 7.30. A bugle effect is heard between musical items. Ern Suffolk is certain now it is Athens. Although call-sign has not been heard. (Before the war, Athens call-signs and frequencies were: SVM, 9.935ms; SVJ, 9.90mc; and SVI, 9.695 mc. Another frequency was 7.075 but I have no record of call-sign.—L.J.K.)

KWID, San Francisco, 9.57mc, 31.35m: This is the frequency now used for broadcasts to New Zealand from 5.15 till

(Continued on next page)

The MONTH'S LOGGINGS

ALL TIMES ARE EASTERN AUSTRALIAN STANDARD TIME

Pressure on space only permits of unusual Loggings or alterations in schedules or frequencies.

Readers will show a grateful consideration for others if they will notify me of any alterations. Please send reports to L. J. Keast, 3 Fitzgerald Road, Ermington, N.S.W.

OCEANIA

Australia
VLK-6, Sydney 16.33mc, 18.37m
 Sydney on this announced frequency was heard testing with London at 9.30 p.m. again at 10 p.m. (Gillett).

AFRICA

British Somaliland
Radio Somali 7.206mc, 42.10m
 A variety show with excellent signal was heard prior to closing at 1 a.m. (Gillett).

French Equatorial Africa
FZI, Brazzaville 11.97mc, 25.06m
 Opens at 3 p.m. at very good strength (Cushen).

FZI, Brazzaville 6.025mc, 49.81m
 Opens at 3 p.m. but only fair (Cushen).

Morocco
Radio Tetuan, 6.067mc, 49.43m
 "The Voice of Spain in North Africa" is heard at good strength from 5.30-6 p.m. (Cushen).
 (Address is: The Service of Press Propaganda and Radio Tetuan.—L.J.K.)

Senegal
FGY, Dakar 11.715mc, 25.61m
 Heard at good strength at 5 a.m.; orchestral music till 5.30, then news in French. suffers from interference from PRL-8, 11.72mc (Cushen).

South Africa
 —, Johannesburg 3.45mc, 86.96m
 Can hear this station in Afrikaans at 5 a.m. BBC News at 6.45 (Suffolk).

THE EAST

Celebes
Radio Macassar 9.37mc, 32.02m
 Good in news and music at 8.30 p.m. (Miss Sanderson).

China
XGTA, Canton 11.65mc, 25.75m
 Heard call-sign at 9 p.m., then news in Chinese (Miss Sanderson). Good signal at 11 p.m. (Edel).

XGOL, Foochow 9.995mc, 30.01m
 Heard call through morse at 11.45 p.m. (Edel). News in Chinese is given on the hour (Miss Sanderson). Spoilt some nights by WWV (Gillett).

KG01, Shanghai 9.66mc, 31.06m
 Call-sign very clear at 9.45 p.m.—L.J.K.

KGAP, Peiping 9.625mc, 31.17m
 Have heard this call here from 9 p.m. onwards—very strong in Oriental programmes (Suffolk). (Call has been given also as KGNC—see "New Stations.")

KPSA, Kweiyang 7.01mc, 42.80m
 Heard nicely when taking Chungking relay at midnight (Gillett, Moore, Miss Sanderson).

KG0Y, Chungking 6.14mc, 48.86m
 Very good signals when VLR-2 closes (Gillett).

XRRA, Peiping 6.09mc, 49.25m
 Is now in the clear (Gillett). (Note change of frequency from 6.10mc.—L.J.K.)

India
VUM-2, Madras 7.256mc, 41.32m
 Splendid signal when closing at 3 a.m.; English is used for about an hour before closing. Identification is "This is Madras... calling" (Gillett).

VUD-11, Delhi 6.01mc, 49.93m

Heard at 2 a.m. with BBC News (Cushen).

French Indo-China
Radio Hanoi 12.135mc, 24.72m
 News in Chinese at 9.30 p.m. (Miss Sanderson). At fair strength at 11 p.m. (Cushen).

Radio Saigon 11.78mc, 25.47m
 Very good at night (Hepburn).

Japan
JVT, Tokyo 6.75mc, 44.44m
 Very fair strength when contacting KGT-5 at 11 p.m. (Gillett).

Korea
JODK, Seoul 2.51mc, 119.1m
 See "New Stations."

Malaya
SEAC, Singapore 11.735mc, 25.57m
 "The Far East Service of SEAC calling from Singapore." Good volume at 7.30 p.m. (Gillett). Excellent at 10 p.m. (Gaden). Heard on this frequency from 6.45-9.45 p.m. News at 7 o'clock (Cushen).

SEAC, Singapore 6.77mc, 44.31m
 Heard at 11.30 p.m. with news in English.—L.J.K. (Miss Sanderson, Gaden). Heard at 9 p.m. and think nearer 6.78 mc (Suffolk).

Radio Kuala Lumpur 6.16mc, 48.70m
 BBC News at 11 p.m.; swing music at 11.30 (Gillett).

Straits Settlements
SEAC, Malacca 17.76mc, 16.89m
 Heard after midnight when PCJ signs. Announces as "Far Eastern Service of SEAC, Malacca" (Cushen).

Thai
Radio Bangkok 6.00mc, 50m
 Heard 8-9 p.m., through morse, with English announcements (Cushen).

GREAT BRITAIN

BBC, London
GSK 26.10mc, 11.49m
GVS 21.71mc, 13.82m
 Heard at 9.30 p.m. (Suffolk).

GRZ 21.64mc, 13.86m
 Opens at 11.30 p.m. in General Overseas Service.—L.J.K.

GSJ 21.53mc, 13.93m
 Heard at 9.30 p.m. (Suffolk).

GSH 21.47mc, 13.97m
 Also heard at 9.30 p.m. (Suffolk).

GSD 11.75mc, 25.53m
 Excellent at 6.15 a.m.—L.J.K.

CENTRAL AMERICA

Panama
HP5J, Panama City 9.607mc, 31.23m
 "La Voz de Panama," R5 from 10-10.40 p.m., but noisy (Edel).

SOUTH AMERICA

Argentina
LRX, Buenos Aires 9.66mc, 31.06m
 From opening with March (I think it may be the Argentine National Anthem) at 8.30 p.m., then news in Spanish till about 9 o'clock, followed by music and Spanish announcements; signal is O.K. (Moore).

LRY, Buenos Aires 9.44mc, 31.78m
 "Radio Belgrano" heard on this new frequency from 8.45 p.m. onwards with good signal but much morse (Cushen).

Ecuador
HCJB, Quito 9.958mc, 30.12m
 Talks and hymns ground 9.30 p.m. (Miss Sanderson).

U.S.A.

San Francisco, unless otherwise mentioned.
KNBI 15.34mc, 19.56m
 Good at 10.15 a.m. (Miss Sanderson).

KWIX 11.89mc, 25.23m
 Good in afternoon; closes at 6.15 p.m.—L.J.K.

KCBR 9.70mc, 30.93m
 Musical programme at 7.15 p.m. (Miss Sanderson).

KGEL 9.55mc, 31.41m

Opens at good strength at 7 p.m.—L.J.K. Good with news at 8 o'clock (Miss Sanderson).

KNBA 7.805mc, 38.43m
 Very good at 10 p.m. (Miss Sanderson).

U.S.A. other than San Francisco
WCBN, New York 17.83mc, 16.83m
 Opens at 11.15 p.m. (Gillett).

WLWR, Cincinnati 15.25mc, 19.67m
 Is outstanding before breakfast... real Crosley touch (Gaden).

WNRI, New York 13.05mc, 22.98m
 Splendid at 9 p.m. with news (Miss Sanderson, Gaden). News at 6.30 a.m. (Miss Sanderson).

WGEA, New York 11.84mc, 25.33m
 Good at 10.15 p.m. (Miss Sanderson).

WLWK, Cincinnati 11.71mc, 25.62m
 Excellent late at night (Gaden).

WCBN, New York 9.65mc, 31.09m
 At really good strength from opening at 8.45 p.m. (Moore).

U.S.S.R.
 13.42mc, 22.35m
 Heard weather reports in Russian just before station left the air a 9.23 p.m. (Edel).

Moscow 8.94mc, 33.54m
 Good at 8 p.m. (Byard).

NEW STATIONS

Continued from page 32

closing at 9.30 p.m. "The Voice of America" gives news at 5.45, commentary by Robin Kincaid at 5.55 and at 6 p.m. "What American Commentators Say."—L.J.K.)

Radio Balikpapan, Borneo, 9.125mc, 32.88 m: Mr. Edel reports hearing this new station with good signals at 11 p.m. when call and frequency is given. At 12.15 a.m. are in relay with PCJ, Hilversum (15.22 and 17.775mc). Station signs at 12.35 a.m., giving call and frequency again. Mr. Ern Moore, of Brisbane, also finds signals good. Rex Gillett reports that at his location (Adelaide) signal is poor before 11 p.m. with recorded music, but at 11, when taking relay of PCJ, signals improve.

XGNC, Kalgan, 9.623mc, 31.17m: Mr. Edel says: "This is the call given at 10.56 p.m. when signal is R6." The "Radio Listening Post," Perth, also gives call as KGNC but Rex Gillett thought call sounded like XNCR. Mr. Ern Suffolk heard the call as XGAP. (Evidently there is a little relaying going on, as the previous call was XGCA.—L.J.K.)

JODK, Seoul, Korea, 2.51mc, 119.1m: Mr. Edel reports hearing this station with news in English at 8.15 p.m. Some evenings signal is R2, whilst on others R7. Arthur Cushen also reports JODK at fair strength with Yank recordings... best at 9.30 p.m. Signs off at 11.30. (Well, this will tantalise a lot of the boys, as it is between short and medium waves and only a few sets other than Communication type will cover it. Seoul or Haiyang is the chief town in Korea and has a population of 394,240.—L.J.K.)

XDA, Chapultepec, 9.925mc, 30.23m: This is a new Mexican reported by Rex Gillett. He says: "The station being heard here is almost certainly XDA, reported in U.S.A. I have noticed a station using Spanish between the listed times of 1 and 1.15 a.m. Signal is only fair."

Sofia, 9.30mc, 32.24m: Ern Suffolk writes: "Read in 'Universallite' that this Bulgarian was on the air and last Friday at 5.30 a.m. heard them in a programme of foreign speech. I figured, however, frequency was nearer 9.33mc. At 6.30 a talk in English and they appeared to close at 6.40 with the announcement, 'This is the Bulgarian Broadcasting Service'... not sure of Service." (The "Universallite" shows call as RODINA and mentions frequency is sometimes 9.31 or 9.32mc. Before the war we used to hear Radio Sofia on 10.31mc, 29.09m up till 8 a.m. and on Sundays were heard again between 3 and 5 p.m.—I first heard them on May 11th, 1940.—L.J.K.)

Speedy Query Service

Conducted under the personal supervision of A. G. Hull

D.L.W. (Preston) enquires about getting some polystyrene.

A.—Yes, polystyrene is manufactured in Melbourne and is readily available now for ham use. It was considered so essential for insulation on the ultra high frequencies used in radar that special steps were taken to set up a polystyrene extruder here. It is available in rods and sheets of various sizes and thicknesses from Etholox Plastics, 108 Chapel Street, Windsor.

* * *

J.L.A. (Box Hill) asks about the 807 type valve.

A.—The 807 is really a transmitting tube, but is available for audio amplifier work too, but a special release form has to be signed to say that it won't be used for transmitting. The 807 can then be operated on the same data as the 6L6G or you can bump up the plate voltage to about 600 volts, keeping the screen down to 250 or 300 volts. The possible audio output of a pair in push-pull is somewhere around 80 watts, enough to turn any ordinary speaker inside out in quick time. The 807 comes with a five-pin base and the plate connection as a cap on top of the glass bulb. On this account it is desirable to make up some sort of covered terminal for this cap, as otherwise the hands may come in contact with the h.t. voltage.

NEW ZEALANDERS!

The quickest and simplest way of subscribing to the

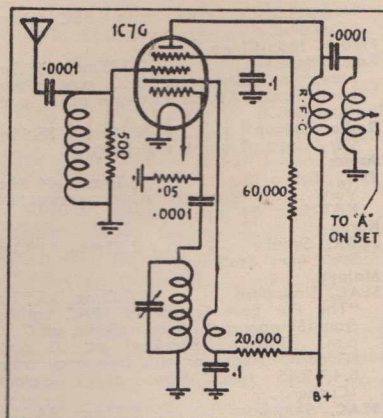
"AUSTRALASIAN RADIO WORLD"

is to get in touch with
H. BARNES & CO.
4 Boulcott Terrace
Wellington

SUBSCRIPTION: 10/6 Per Annum

They will arrange all the details and give you prompt and courteous attention.

DO IT NOW!



In response to requests, here is the circuit for a short-wave converter to use a single-gang condenser.

S.C.A. (Condobolin) asks about back numbers.

A.—Of the 1944 issues, all are available except the October number. Of the 1945 issue we are out of stock of April, May and December. We expect that a few December issues may come back from interstate distributors in the next week or

"RADIO" OR WIRELESS

Who originated the term "radio"? In answer to this question the following was recently published in Washington, D.C.: "There has been some controversy over the origin of the word. It appears to have been first used in the United States by Donald McNicol in the title of a series of articles in "Western Electrician" during 1906-1907."

Donald McNicol, who is technical consultant of "Telegraph and Telephone Age," writing in that journal, states: "I did not originate the term. The word was first used at the 1903 protocol in Berlin when the Germans pushed it forward because the British and Americans had adopted 'wireless.' What connection I had in the matter was in using the word 'radio' first in an American treatise of book-length on the subject."

two, but as there are not likely to be many, we suggest placing your order immediately if you want one reserved. Price 1/-, post free.

* * *

R.G. (Ya'lourn) enquires about the alignment of receivers when iron-cored coils are used.

A.—Generally speaking, the iron cores should not be used for alignment. The gang should have trimmers or else trimmers of the midget condenser type should be wired across

SPECIAL NOTICE

All queries should be addressed to—

AUSTRALASIAN RADIO WORLD

336 Waverley Road
East Malvern, Vic.

the coils for alignment purposes. Unless specially advised to do so by the coil makers, you should not interfere with the setting of the iron cores. Under special circumstances the iron cores can be adjusted to overcome tracking errors or to assist in getting correct padding operation, but don't mess around with them unless you are quite clear about what you are trying to do.

* * *

N.D.D. (Hampton) asks about re-mitting money for small amounts.

A.—Stamps are quite acceptable, either 1½d. or 2½d. being preferred, but 1d. and ½d. stamps also come in handy. If the amount is over 3/-, we suggest a postal note as being easier.

* * *

C.B. (Croxtton) wants to buy a two-gang condenser.

A.—These tuning condensers have been in short supply during the war, but that must be just about over by now. We strolled into Magrath's the other day and noticed that he had a shelf full of two-gangs and a large notice up that they were available in any quantity at 12/6 nett, plus tax. They may not be of the type you specify, but should work with the coils you have, dial readings being a little out being about the worst that could happen through using them.



THE COUNTERSIGN OF DEPENDABILITY IN ANY ELECTRONIC EQUIPMENT

Tests Prove Eimac Vacuum Condensers Far Superior in Operating Efficiency

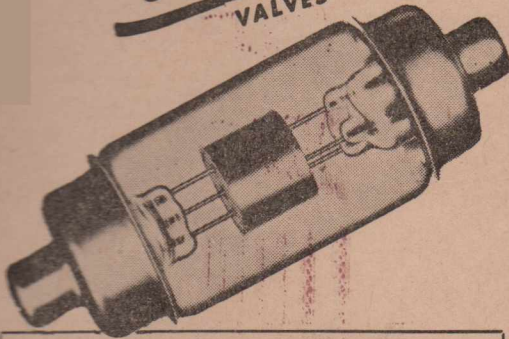
Ability to handle high current at high frequencies is the true measure of the performance of a capacitor. A high peak voltage rating based on low frequency measurements does not tell the whole story.

The chart on this page shows the results of tests at 50 Mc. conducted on a standard Eimac VC50-32 Vacuum Capacitor and three other 50 mmfd. vacuum capacitors, designated on the chart by "A," "B" and "C." At just over 17 amps. (approximately 1525 peak volts across the capacitor) Unit "A" (rated at many times the applied voltage) became sufficiently heated to melt the solder on the end caps. Under this same test, the Eimac VC50-32 operates at less than 70°.

Eimac introduced the vacuum capacitor in 1938. It is interesting to note that the original Eimac capacitor design is still outperforming all comers. Such outstanding performance is typical of all Eimac products, which is one of the reasons why they are first choice of leading electronic engineers throughout the world.

1113

Follow the leaders to



EIMAC VACUUM CAPACITOR TYPE VC50-32

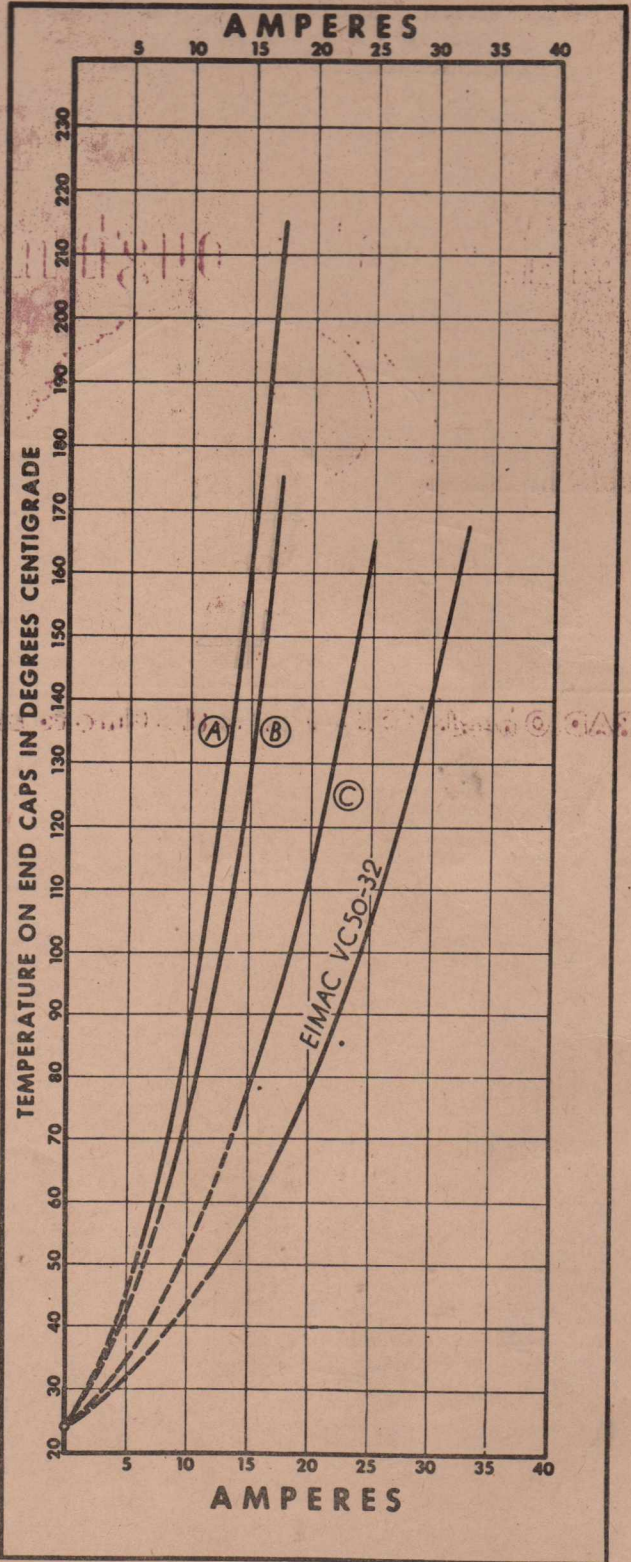
General Characteristics

MECHANICAL:

Maximum Over-
Length 6.531 inches
Diameter 2.281 inches

ELECTRICAL:

Maximum Peak Voltage 32,000 volts
Maximum RMS Current 28 amps.



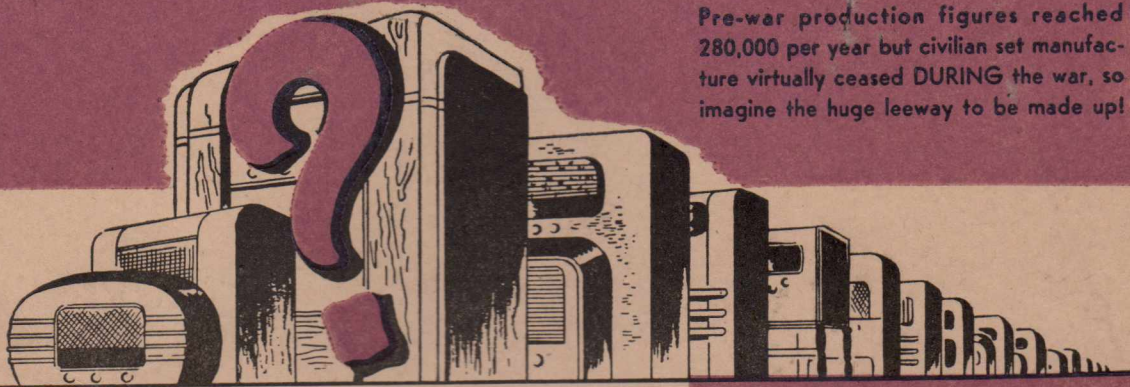
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MORE THAN A QUARTER MILLION NEW RADIOS NEEDED YEARLY

...and not enough men to make them



Pre-war production figures reached 280,000 per year but civilian set manufacture virtually ceased DURING the war, so imagine the huge leeway to be made up!

RADIO needs YOU - Now is the time to act!

Every major set manufacturer is short of trained men and that goes for every other branch of the industry. Electronics and the civil adaptation of Radar are now being developed with great speed, but the cry is for more and more skilled men!

We are entering now a Radio age, an Age which has a place for YOU. Radio, a young industry which has made remarkable progress in the past few years, wants **trained** men urgently to fill vital positions. If you want security, prosperity, and a recognised status in the community, start training NOW.

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