

Twelve Uses  
for an  
R.F. Oscillator



*With The Compliments of*

**Slade-~~London~~**

**Test Equipment Manufacturers**

Croydon, Sydney

**BLOCH & GERBER**  
**LTD.**

WITH WHICH IS ASSOCIATED

**THE WELDON ELECTRIC COY.**

46-48 YORK STREET,  
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TELEPHONES: MA 6291 (9 Lines)

SAME-DAY SERVICE

*for—*

**RADIO & ELECTRICAL**  
**ACCESSORIES**

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*ALSO*

WELDON, STROMBERG-CARLSON, AIRZONE,  
RADIOLA, PHILIPS, EMMCO, S.T.C. WIRELESS  
SETS, CROSLY ELECTRIC REFRIGERATORS,  
SLADE-PATON TEST EQUIPMENT.

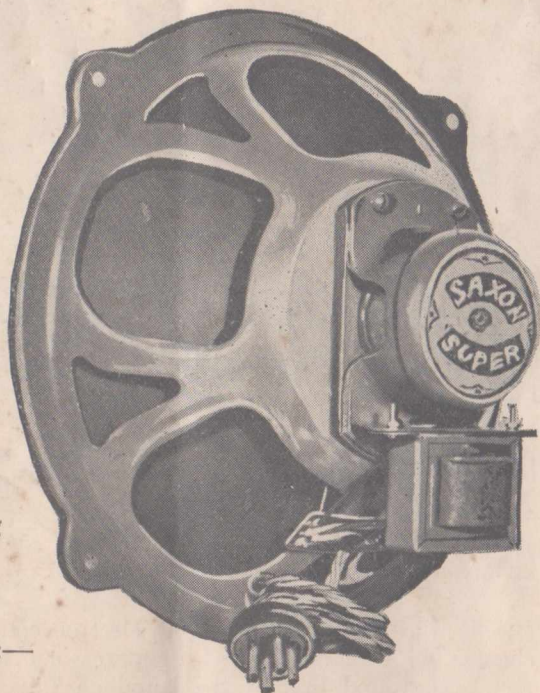
*William Robert Brown*

FOR BETTER RECEPTION, USE THE NEW

## Super Saxon Speaker

Here's an achievement—the outstanding improvement of speaker design for 1934, and in good time for use in the 1935 range of receivers.

11in. CONE



*Some  
Outstanding  
Points  
of  
Superiority:—*

11-inch cone of special moisture-resisting material for greater response.

An entirely new and improved voice coil suspension with specially treated paper voice coil—definitely moisture proof and will not warp. Improved field coil and housing.

Extra heavy input transformer insures against burn-outs.

Field coil wound with special heavy gauge wire.

Beautiful satin grey finish.

*Greater Fidelity — Perfect Tone — And the Price is Right.*

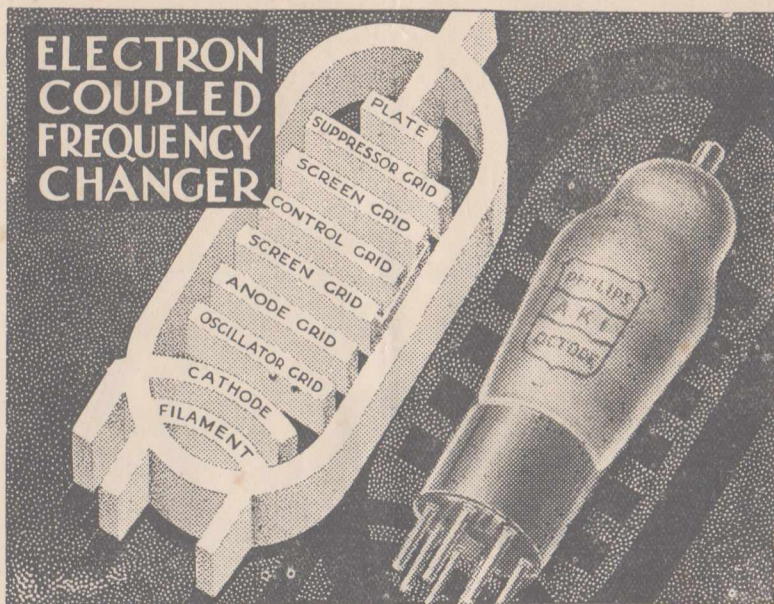
*Use the Super Saxon for SATISFACTION.*

WHOLESALE ONLY

### ECLIPSE RADIO PTY. LTD.

137 Clarence Street, Sydney. B 6937  
156 Creek Street, Brisbane. B 7340

216 City Road, Sth. Me'bourne. M 4681  
43 Austin Street, Adelaide. Cent. 929



OFFERING outstanding advantages over all previous types of frequency convertors, the Philips Octode is the most important development in valve design for several years, and in its application to modern super-heterodynes eclipses even the penthode in the creation of new standards.

Briefly, the Philips Octode is an electron coupled frequency changer with the addition of a suppressor grid. The excessive background hiss of the autodyne valve, so long considered inevitable in super-heterodynes, has been effectively obviated. By the incorporation of penthode characteristics the anode current of the Octode has been kept down to the remarkably low figure of 0.8 milliamp. Background hiss is directly proportional to the anode current and is thus practically eliminated by the Octode.

Tests have demonstrated that the Octode is particularly efficient on short waves, whilst it makes a definite contribution towards high fidelity ideals, enabling wider frequency ranges to be achieved with minimised noise level.

**PHILIPS OCTODE**

# Twelve uses for an R.F. Oscillator

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## CHAPTER I

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### *Introduction*

The advancement of radio design and engineering has brought with it an increasing need, not only for test equipment, but for detailed information as to the application of same in the field of set building and servicing.

There are few, in this comparatively new industry of Radio, who are in the fortunate position of having had a thorough technical training, consequently there may be some, particularly in the country, who perhaps will welcome the information contained in this booklet.

It is the aim of Messrs. Slade and Paton to help Radio Dealers to get the greatest possible amount of assistance from modern Test Equipment.

The purpose of this booklet, which we hope will be one of a series, is to help the service man to gain an appreciation and a knowledge of the correct procedure in the use of a modern Oscillator or Signal Generator, in conjunction with a multi range rectifier type output meter.

This combination—The Oscillator and Output Meter—if intelligently and systematically operated, will prove one of the most valuable and versatile pieces of testing apparatus that the service workshop can be equipped with.

Experience will show that it is well nigh impossible to perform a 100% test job without some form of controlled signal generation. This applies not only in the case of aligning and tracking, but also in the process of bringing a set's performance back to its original standard.

## TWELVE USES FOR AN R.F. OSCILLATOR

# CHAPTER II

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### THE QUESTION OF DESIGN.

The utility and value of a modulated Oscillator will depend on two essential points, viz., Stability and Output Control.

A staple Oscillator, with an attenuator varying evenly from zero reading to maximum, is the ideal which the following features will help to achieve.

#### (1) COMPLETE SHIELDING.

The instrument should be housed in a metal-lined cabinet, with the valves and coils individually shielded.

For preference, the Oscillator should be battery operated, as A.C. Oscillators, unless well filtered, tend to feed back into the line and detract from the performance of the attenuator.

#### (2) ELECTRON COUPLED OUTPUT.

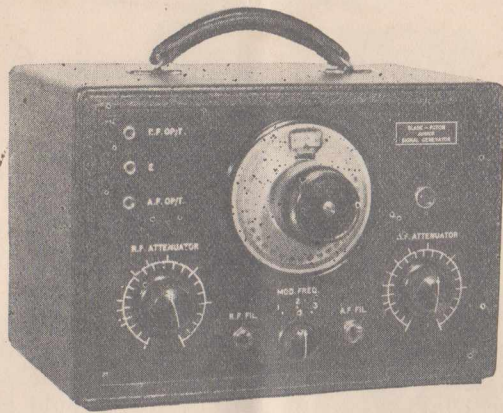
In electron coupling the output energy is not drawn from either the primary or secondary circuits. This is one of the reasons why this type of circuit is more stable than that of the older type of Oscillator using a triode valve.

Then, again, the energy supplied to the output potentiometer is constant. This will enable the Dial of this control to be marked off effectively either logarithmically or in plain degrees.

#### (3) SEPARATE VALVE FOR MODULATION.

There is no doubt that a separate modulating valve has many advantages over both grid blocking and the A.C. hum method of obtaining modulation.

Its advantages outweigh by far the initial cost. A separate valve enables both Audio pitch and modulation depth or percentage to be varied, and as well as having a pleasanter note, has the added advantage in that it can be used individually as an Audio Oscillator, for the testing of public address amplifiers, or in conjunction with a wheatstone bridge, etc.



## THE SLADE-PATON JUNIOR SIGNAL GENERATOR

*Comprises:—*

- A Modulated Oscillator.
- A Straight R.F. Oscillator.
- An Audio Oscillator.

FEATURES:—

- (1) Employs electron coupling, which, with correct constants, will give the highest degree of stability possible.
- (2) Thorough shielding.
- (3) Calibrated Attenuator (units and decibels).
- (4) Perfect control of output, down to a fraction of a millivolt.
- (5) Separate Attenuator for Audio output.
- (6) Three range variation of Audio Note.
- (7) Variation of modulation depth.
- (8) Provision for external modulation.
- (9) Special Vernier Dial.
- (10) Wide Range Band switching from 158-1500 Kilo. Cycles. Harmonics for Short Wave Band, extending range to 15 Mega. Cycles. Complete with Batteries as illustrated. Price £12/12/- nett.

Factory type, output meter and Signal Generator combination in large heavy aluminium case, complete with meter (four ranges), cords and plugs, price £16/19/6 nett.

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 1

#### ALIGNING T.R.F. RECEIVERS.

A T.R.F. receiver fitted with a gang condenser not of the slotted and plate type cannot be made to track perfectly over the entire band, unless a variable trimmer as one of the operating controls is incorporated, otherwise, exact alignment can only be achieved at one point on the Dial. This is due to the effect of the antenna capacitance and inductance on the first R.F. circuit.

It remains then for the service man confronted with this type of set (minus variable trimmers) to decide as to which point on the Dial the aligning adjustment should be made for best results.

A lot will depend on the locality. If interference from one particular station is the problem, line up at this frequency. Usually, however, the trimmers are peaked at three or four points along the Dial, and a mean adjustment then arrived at. Should the set have a variable trimmer manually operated, then this trimmer should be turned half way out of mesh, and the aligning done midway along the Dial.

The process of tracking can then be gone on with, as follows:—Disconnect the antenna from the radio set, replacing with shielded lead from the Oscillator (usually marked R.F. output). The other lead from the Oscillator goes to the earth terminal on which the ground wire is left attached.

The output meter is then connected as previously described. Switch on both Oscillator and set. Adjust Oscillator Dial to the required frequency. Tune in the set to the signal, selecting the range of the output meter so that about high scale deflection is shown at peak.

The adjustment of the various compensating condensers on the side of the gang can then be gone on with.

As the screwdriver (preferably a bone or ivory one) brings each section of the gang into line, the output meter will show increase. As it approaches maximum deflection, reduce the Oscillator attenuator. Carefully adjust each trimmer so that a fraction of a turn either way will cause the needle to drop.





The  
Slade-  
Paton  
A.C., D.C.  
Analyser

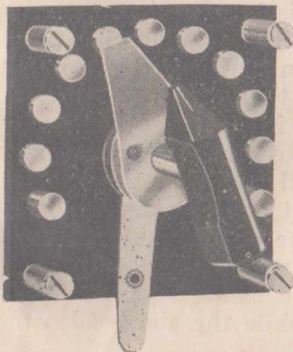
(SENIOR MODEL)

Containing several exclusive features, this instrument more than favourably compares with any Analyser in the world, regardless of price. The operation is simplicity itself, being almost completely fool proof, affording the maximum of safety to the sensitive meter and copper oxide rectifier.

The meter, a sapphire jewel bearing d'Arsonval (1,000 ohms per volt), is equipped with artificially aged over-sized magnets, knife pointer and staggered A.C. scale. This instrument is particularly suitable for service conditions, in that it combines ruggedness with a high grade precision. Our Bridge calibrated D.S.C. non-inductively wound multipliers, in conjunction with the meter, assures an accuracy of well within the standard 2%.

The Analyser is a multi-instrument in one, reading D.C. volts to 500 v. A.C., and OUTPUT volts to 500 v., Milliamps to 100 M.A.'s, Ohms, 100,000 on scale. Inductance to 200 Henries, and capacity to 2 M.F.

Features: Universal socket, shielded grid lead on cord (both necessary to reduce capacity effects when testing R.F. stages of super-heterodynes); grid shift test for checking valves; D.C. isolated when taking all A.C. and output readings; point to point resistance measurements; moulded bakelite panel with embossed lettering; extra long coloured test prods; complete with adaptors in black leatherette case. Price, £15/15/- nett. Junior Model price, £12/17/6, plus tax. D.C. Model price, £10/10/- nett.



**THE SLADE-PATON**

Perfect Contact Instrument Switch,  
with Click Action.

Single or Double Deck.

PRICE ON APPLICATION.

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 2

#### **ADJUSTING T.R.F. RECEIVERS, FITTED WITH SLOTTED PLATE TYPE GANG CONDENSER.**

Receivers having a slotted plate condenser can be made to track over the entire scale, by carefully bending the segments of the end plates until correct alignment is attained in each of the individual sections (usually five or six).

Adjustment should be made at such Oscillation frequencies that in each case, when the receiver is tuned to the Oscillator frequency, the split segment is about half way in mesh with the stator plate.

The process, when first attempted, may prove somewhat tedious. A little practice will soon remedy this. Well matched coils and a good make of condenser will simplify matters.

### No. 3

#### **NEUTRALISING T.R.F. RECEIVERS.**

In the old Neutrodyne, many of which are still in operation, neutralisation may be made with the Oscillator at the high frequency end of the Dial. The filament circuit of each R.F. valve in turn is broken by inserting a piece of paper between valve pin and socket contact.

The neutralising condenser should then be adjusted until the output meter shows minimum deflection.

### No. 4

#### **ALIGNING INTERMEDIATE TRANSFORMERS. PEAK FREQUENCIES.**

Connect up output meter and clip the R.F. output wire of the modulated Oscillator to the grid of the valve ahead of the second detector, the other clip connecting to chassis.

Turn on set and Oscillator and adjust the Oscillator Dial to the required frequency. Select the output meter to show about half scale deflection and then proceed to tune the transformer feeding the second detector.

Adjust the grid circuit of this intermediate transformer first, and then carefully the plate circuit. When the point for greatest needle deflection has been arrived at you can then proceed to repeat the operation on the percentage stage.

Due to body capacity effects in the intermediate transformers, it is highly advisable to use insulated screwdrivers of bone or ivory. Even so, it is as well to remove the driver after the condenser has been turned just a bit (when finally peaking), and note the response on the output meter. The final critical adjustment may need to be made in this manner.

Note.—If the super-heterodyne has a separate Oscillator valve, this should be pulled out while the above adjustments are being made.

# The Slade-Paton Valve Tester

## *Make a Feature of Valve Testing*

Tests to a degree all American and English type Valves,  
DIRECT on the meter dial as "GOOD," "POOR," "BAD."



### FEATURES:—

- (1) Direct reading.
- (2) Line regulation with check on meter.
- (3) Mutual conductance test.
- (4) Allows clients to see for themselves.
- (5) Simplifies sales.
- (6) Shorts cathode leakage and second plate readings.

For those properly equipped Valve replacement sales should prove a remunerative side line. It is a significant fact that over one million valves are sold annually in Australia.

Price, complete, as illustrated, £10/10/- nett.

D.C. operated model, price on application.

An attractive Solaglow Window display sign is given free to all purchasers of these instruments.

---

Ohm-meters, Multi-meters, Wheatstone Bridge, made to any specification.

Special D.S.C. Bobbin Resistors for Meters or Bridges wound to the highest degree of accuracy.

Engraving executed for the trade.

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 5

#### INTERMEDIATE LINE-UP WHEN USING A.V.C.

Adjustment of the intermediate circuits and the padding in the super-heterodyne equipped with automatic volume control offers quite a problem. It is customary to adjust for greatest volume with the aid of an output meter. But this method is not dependable in a circuit where the gain is affected by the strength of the signal.

There are several methods by which the adjustments can be made in spite of the A.V.C. The simplest perhaps is to kill the automatic volume control, so that the output meter method can be used just as if no A.V.C. were built into the circuit. To kill the A.V.C. it usually suffices to short circuit a condenser, the condenser that is connected from the junction of the various individual resistors and the single resistor which goes to the Diode. Another method is to have a socket adaptor which will enable a very sensitive meter to be inserted between the diode pin and its resistor, from which the automatic biasing voltage is attained. The current through this resistor will be small—about 50 to 100 Microamps, depending on the size of the resistor—so that naturally a very sensitive meter would be required to get a good deflection.

Perhaps the simplest way is to attenuate the incoming signal from the test Oscillator to such a degree that the R.F. voltage is not strong enough to bring the A.V.C. into operation.

For good deflection it will be necessary to select a low range on the output meter. A sharp, definite peak will indicate the absence of A.V.C. influence.

### No. 6

#### ALIGNING INTERMEDIATE TRANSFORMERS FOR FLAT TOP.

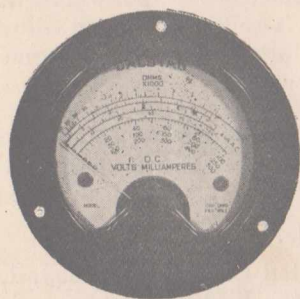
Some manufacturers design their intermediate stages so that its tuning curve is flat-topped in order that the band-pass effect minimises the suppression of sideband frequencies.

For "flat top" resonance the modulated Oscillator must be set a few kilocycles off resonance, that is, if the intermediate frequency is fundamentally 175 K.C. the Oscillator is set at 172.3 kilocycles and one of the intermediate circuits is peaked at this frequency.

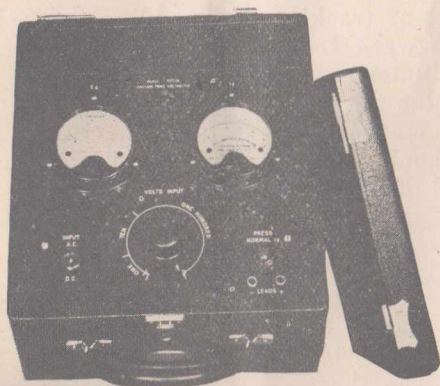
The Oscillator is then set to 177.8 K.C. to which the other remaining intermediate is aligned. The output meter should show no appreciable change when the test Oscillator frequency is shifted from the former to the latter.

# The "CALSTAN"

(CALIBRATED TO STANDARDS)



This exceptionally high-grade instrument incorporates the following features: Oversize tungsten magnets (artificially aged), dead beat movement of the knife-edge pointer, sapphire jewel bearings, moving coil wound with D.S.C. wire, approximate resistance 27 ohms, metal universal dial with staggered A.C. scales, ohms, etc.; standard 0-1 M.A. Complete in polished bakelite case. Price, £1/18/6 nett trade. Can be supplied with any range of sensitivity from 200 microamps. at small extra cost.



Vacuum Tube Volt Meter Direct Reading  
3 Ranges, as illustrated  
*Price on application*

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 7

#### TO ALIGN OSCILLATOR CIRCUIT IN A SUPER-HETERODYNE.

Many service men are rather diffident of attempting the adjustment of the Oscillator circuit of a super-heterodyne, which follows the lining up of the intermediates, yet there is nothing difficult about it.

The method of procedure is as follows:—Connect up the output meter and couple the modulated Oscillator to the aerial and earth terminals of set. Switch on, then:—

- (1) Open out padder.
- (2) Adjust modulated Oscillator to, say, 1,450 K.C., and tune in the set (at the high frequency end of Dial) for maximum deflection, as shown on the output meter.
- (3) Peak the Oscillator section of the gang condenser.
- (4) Follow by peaking the other (R.F.) sections of the gang.
- (5) Turn modulated Oscillator to 600 K.C. and tune set to this frequency.
- (6) Carefully adjust padder for maximum deflection.
- (7) Turn back modulated Oscillator and set to 1,450 K.C.
- (8) Make a final critical re-adjustment of the Oscillator trimmer.

The object of tracking and padding is to obtain a fixed relationship between Oscillator and R.F. circuit; in other words, the Oscillator is made to tune to a frequency equal to the R.F. circuit, plus the amount of the intermediate frequency, at all positions on the band.

A check should be made to see if this relationship is holding at each end of the Dial after the final adjustment No. 8 has been made.

To do this go back with Oscillator and set to 600 K.C., tuning carefully to this point. Now note the effect on the output meter of a fraction of a turn of the Oscillator trimmer. It should drop sharply if turned slightly either way, indicating that perfect tracking has been attained.

An increase in the output meter means that the whole procedure should be gone over again, as one adjustment slightly affects the other.

Note.—Never adjust any trimmers at 600 K.C. after they have been set for 1,450 K.C.

Pictorial Diagram of Connections  
of an Efficient Output Meter

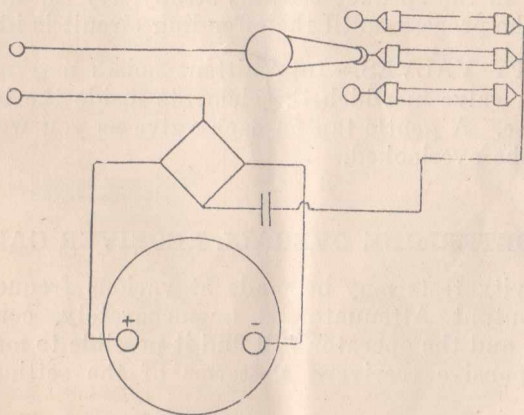
using a

Triplett 0.1 MA Meter

*With the Compliments*

*of*

**W. G. WATSON & CO. LTD.**



Advertisement of W. G. WATSON'S,  
279 CLARENCE STREET, SYDNEY.

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 8

#### NOISES AND LOOSE CONNECTIONS.

Noises in a receiver are often due to a bad contact somewhere in the circuit.

The Oscillator provides a ready means of locating same.

Couple the Oscillator to the input of set, switch on, and apply a strong modulated signal of a frequency within the broadcast band.

When the Audio note is heard, go over wires and components, moving and shaking same while listening for evidence of the faulty contact in the otherwise steady note coming from the speaker.

Should the source of the trouble be rather illusive and difficult to find, the Oscillator should be used in such a way as to be able to locate the particular stage in which the fault lies.

The method of procedure is to work from the Audio stage towards the R.F. end, stage by stage. You may start by coupling the Oscillator to the grid of the second detector and with the preceding tube pulled out, shake and jar the chassis. If the note in the speaker remains steady, try the next stage, repeating the process, until the offending circuit is identified.

**FAULTY VALVES.**—Intermittent noises may sometimes be due to a valve in which the elements inside the bulk have become loose. A gentle tap on each valve as you work along should not be overlooked.

### No. 9

#### TO DETERMINE OVERALL RECEIVER GAIN.

Sensitivity tests may be made at various frequencies, as the R.F. output Attenuator is an accurately, controllable instrument, and the operator will find it possible to make notes on the responsive receivers, in terms of the setting of the Attenuator.

This means that if the setting of the R.F. output control necessary to give a certain output from the receiver is recorded, these values may be used for comparison of the sensitivity of the same receiver, or one of the same type, at a future date.

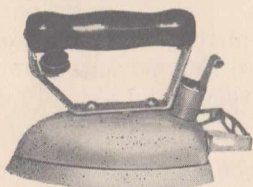
Accumulation of data of this type is of great value to the service man, for its use makes it possible to ascertain the condition of the receiver, as it is received from the customer, in comparison with the condition when it was returned to same.



They Instantly Appeal  
AND MAKE SATISFIED CUSTOMERS FOR  
LIFE

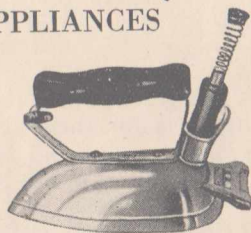
# SWITCHON

ELECTRICAL APPLIANCES



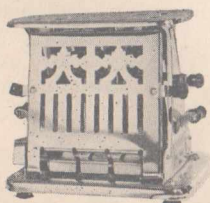
### The Domestic Iron

A medium-priced iron of good quality and performance. Sturdily constructed with the best of materials and attractively finished in chromium plate. Fitted with convenient thumb rest and a specially designed air-cooled heel rest. Has an element made from the best mica and nichrome wire. Will give years of ironing service.



### The Wrinkleproof Iron

An iron of outstanding quality and appearance—this new "Switchon" is not "just another iron," but really something different and better. Its Wrinkleproof round heel will instantly appeal to women. No sharp corners to drag or wrinkle the materials—takes the drudgery out of ironing. Fitted with all-over heating unit made with only the best of mica and nichrome wire. Beautifully finished in gleaming chromium.



### The De Luxe Toaster

The aristocrat of Toasters—its beauty of finish and design make it a toaster to be desired by all. Rust-proof! Yes, its frame is constructed of brass and then heavily plated—an assurance that it will retain its appearance for a lifetime. Convenient knobs fitted in the centre of the toast-rack, ensuring the easy turning of the bread.



### The Hot-Water Jug

Made only with the finest quality porcelain and beautifully finished with a highly-glazed surface which is guaranteed not to craze. It is of good design and fitted with a special pivoting porcelain lid that cannot open once the plug is fitted.

*Full particulars from*

**W. G. WATSON & CO. LTD.**  
279 CLARENCE STREET, SYDNEY.

## TWELVE USES FOR AN R.F. OSCILLATOR

### No. 10

#### TO CHECK VALVE EFFICIENCY.

The Oscillator and output meter supply a very effective method of checking the efficiency of a valve. Apply a signal from the Oscillator to the Antenna and ground terminals, and tune in on output meter on a range which will give about half scale deflection.

Now, without altering the volume control, go through the set from one end to the other, replacing valves one by one, and noting the increase, if any, the new valve will show on the output meter.

This is a test that can be made in the customer's home, as it lets them see for themselves, the difference in output readings, between the old and the new valve, and should simplify the sale of a valve, if one should be needed.

As a rough guide, a twenty per cent. increase in the output reading by a new valve will indicate that a replacement is necessary.

#### TESTING A.V.C. VALVES.

In circuits using a separate valve to obtain automatic volume control, a test can be made to find the most efficient valve to function at this point.

Connect the Oscillator to the input and adjust set for half scale deflection on the output meter.

Now substitute several valves of the same type for the one already in the A.V.C. socket.

The valve that reduces the output reading most should be the best one for the purpose.

### No. 11

#### STAGE ANALYSIS.

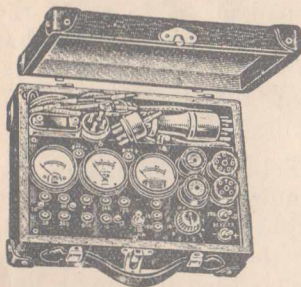
When the Radio man has a set to service, the usual procedure is to bring out an Analyser, and systematically to seek the trouble by plugging in from valve to valve.

This method, in most cases, will enable the operator to quickly locate the trouble. Nevertheless, there are times when the Analyser will fail, in that it will show every valve and circuit apparently in order and yet the fault still persists.

# A PAGE YOU SHOULD READ . . . . .

## READRITE

## Set Analyzer and Continuity Tester Model No. 710



This three meter tester is equipped with a practical selector switch for checking all parts of tube circuits by connecting to tube sockets. Line supply volts are also measured. In addition to making all the tests for voltage, this versatile tester will also make all continuity resistance tests **without removing the chassis from the cabinet.** It will test condensers for capacity and resistors for resistances up to 100,000 ohms. Scale readings are: 0-20-60-300-600 D.C. volts, 0-10-140-700 A.C. volts and 0-15-150 M.A. This tester comes complete with full easily understood instructions. A 4½ volt battery and all necessary test leads are included.

**List Price £9/5/-**



## PRECISION METERS

Accuracy—2%

Triplet D.C. Instruments are the D'Arsonval type with an extra light moving coil and reinforced strong parts. All parts accurately placed on Bakelite mounting plate. White enamelled dials. **Triplet A.C. Panel instruments are the movable iron repulsion type with Sapphire jewel bearings.** All are air damped. Accuracy 2%.

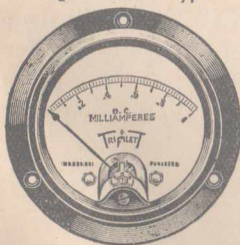
**HIGH QUALITY—  
LOW PRICES**

## READRITE NO. 550 TEST OSCILLATOR

Completely shielded and self-modulated. Indispensable for alignment of R.F., I.F. and oscillator circuits, for locating defective R.F. and I.F. transformers, comparing gain in tubes and checking the sensitivity of receivers. Uses a type 30 tube, battery operated, as a self-modulated oscillator. An output meter, with break-in adapter, is built in the case for visual indication of receiver output. Calibrated scale is furnished showing settings from 110 to 1600 K.C. for I.F. and broadcast bands.

**£13/-/-**

Model 321,  
3½ in. Flush Type.



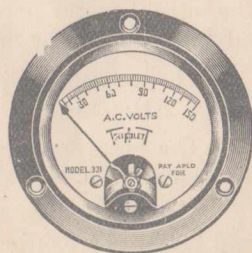
0—1  
Millimeter

## Panel Meters

Good Serviceable Instruments. Guaranteed accuracy within 5%. Suitable for practically all purposes. These Readrite Panel Meters are provided with a wide mounting flange.

Requires a 2 5/6 in. hole. Standard finish, black flange and nickelled bezel. Dials are special white enamelled finish.

Model 331,  
3½ in. Flush Type.



FACTORY REPRESENTATIVES FOR AUSTRALIA AND NEW ZEALAND:

**W. G. WATSON & CO. LTD.**

279 CLARENCE STREET, SYDNEY  
NEWCASTLE, MELBOURNE, HOBART, LAUNCESTON, ADELAIDE, PERTH.

## TWELVE USES FOR AN R.F. OSCILLATOR

Here the modulated Oscillator will prove invaluable, as stage to stage analysis can be quickly made and the trouble definitely localised.

The method of making stage analysis is to apply the output of the service Oscillator to the circuit preceding that of the output and noting the response on the output meter. Work back towards the aerial, noting the amplification of each stage until the faulty stage is identified.

It remains then to be seen as to whether the fault is in the primary or secondary circuits of offending stage. After this test is made by touching the R.F. output cord on to the grid, which will be the secondary side, or the plate of preceding valve which is the primary, the search is then narrowed, and the trouble should be quickly run to earth.

### No. 12

#### SELECTIVITY TESTS.

The modulated Oscillator and output meter can supply a rough but very effective indication of a receiver's selectivity, which can be used to advantage in many ways.

The practice of making a selective test on all receivers, both before and after servicing, has much to commend it, as against the rule of thumb method of checking against a station.

The principle of the test consists of applying a signal from the Oscillator to show at resonance a certain standard reading on the output meter.

The Oscillator Dial is then shifted 10 K.C. This will drop the output meter needle. The Attenuator of Oscillator is then advanced until the meter reads as at resonance.

The amount of this advance as shown on the graded Dial of the Attenuator will indicate the receiver's selectivity.

The greater the amount of advance the sharper the tuning, and vice versa.

This 10 K.C. of resonance test should be made both above and below the original setting.

The operation should be carried out at both ends of the Dial, at, say, 600 K.C. and 1,450 K.C.

# CHAPTER III

## THE OUTPUT METER.

The output meter consists of a good 0 to 1 M.A. meter in conjunction with a copper oxide rectifier.

Three or four ranges are required from ten volts upwards.

The usual method of hook-up is either across the speaker's input transformer, or else from plate of power amplifier to filament or cathode.

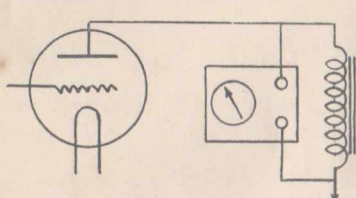


Fig. 1

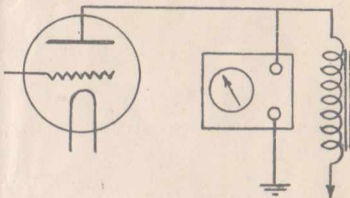


Fig. 2

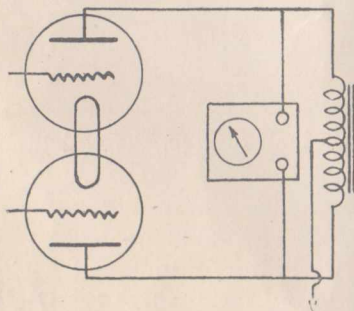


Fig. 3

Figs. 1, 2 and 3 show the various methods of connecting up Output Meter

Meter leads equipped with small alligator clips can be used to clip on to the respective socket legs, when the servicing is done with the chassis on the bench. If it is desired to connect up the output meter while the set is still in the cabinet, some method of connecting the meter leads to the speaker plug or power valve will need to be devised.

The writer uses a couple of lengths of spring copper wire, spaghetti covered, which have an eyelet at one end, that can be slipped tightly over the pins, and enable the meter leads to be connected up to same.

## TWELVE USES FOR AN R.F. OSCILLATOR

In lieu of this, two lengths of rubber flex can be bared for half an inch or so and tightly wound round the pins, taking care they do not short to chassis.

In the case of the speaker input transformer, the correct pins on the speaker cord will need to be identified with an Ohm meter. The average resistance of the input transformer will be about 300 Ohms, so that its pins can easily be identified as the field coil will be found to be much higher.

## DUMMY ANTENNA

The use of Dummy Antenna for coupling the R.F. Oscillator to a receiver's input is advantageous, as the set will then operate under more normal conditions.

The Dummy Antenna has similar characteristics to the average aerial, and as they are simple of construction, the use of one is advised.

The Dummy Antenna is nothing more than a coil, a resistance, and a mica condenser.

The coil can be thirty turns of number thirty-two B. & S. enamel wire on a one and a quarter inch former, the resistance twenty-five Ohms and the condenser .0002 M.F., all being in series.

The circuit arrangement is shown graphically in Fig. 4. This device is inserted between Oscillator output and aerial terminals of receiver, and is used on all tests where the Oscillator feeds the receiver through the regular Antenna input.

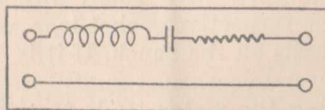


Fig. 4. Dummy Antenna.

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