



RADIOTRON

AMALGAMATED WIRELESS VALVE COMPANY LIMITED

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**6P6—R.F. Power Amplifier
Pentode.**

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6P6

New Radiotron R.F. Power Pentode Suitable for Suppressor Grid Modulation

In order to satisfy the demand for an R.F. Power Pentode suitable for Suppressor Grid Modulation, Amalgamated Wireless Valve Co. Ltd. has pleasure in announcing the release of the 6P6 at a price which will bring it within the reach of many who have been unable to afford a more costly valve. The 6P6 is designed and manufactured in Australia.

Radiotron 6P6 is an Australian-made low-power pentode transmitting valve intended primarily for use as a suppressor-grid modulated R.F. power amplifier (telegraphy), crystal or electron-coupled oscillator, and frequency multiplier. The plate connection is brought to the top of the bulb in accordance with standard practice, giving reduced grid-plate capacity, and simplifying the layout. In general, it will be found advisable to take the precaution of neutralising the grid-plate capacity.

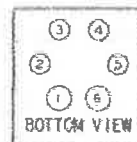
The bulb and base are similar to type 42, and the base connections are similar except that the suppressor in the 6P6 replaces the plate of the 42.

Tentative Characteristics

Heater voltage	6.3 volts.
Heater current	0.7 amps.
Grid-plate capacity	0.7 $\mu\text{mf.}$
Input capacity	8 $\mu\text{mf.}$
Output capacity	12 $\mu\text{mf.}$
Bulb	ST.14.
Cap	Small metal.
Base	Medium 6 pin.

Bottom View of Socket Connections.

- Pin 1—Heater.
- Pin 2—Suppressor.
- Pin 3—Screen.



- Pin 4—Control grid.
- Pin 5—Cathode.
- Pin 6—Heater.
- Top Cap—Plate.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS.

As R.F. Power Amplifier and Oscillator—Class C Telegraphy (Key down conditions)

D.C. Plate Voltage	..	450 volts max.
D.C. Screen Voltage	..	200 volts max.
D.C. Plate Current	..	50 milliamps max.
D.C. Grid Current	..	7.5 milliamps max.
Screen Input	..	4 watts max.
Plate Dissipation	..	10 watts max.

Typical Operation.

D.C. Plate Voltage	..	450	250 volts.
D.C. Screen Voltage	..	200	150 volts.
D.C. Grid Voltage	..	-90	-80 approx. volts.
Suppressor Voltage	..	0	0*
Peak R.F. Grid Voltage	..	150	140 approx. volts.
D.C. Plate Current	..	45	34 milliamps.
D.C. Screen Current	..	14	18 milliamps.
D.C. Grid Current	..	2	4 approx. milliamps.
Driving Power	..	0.7	1.3 approx. watts.
Power Output	..	12	5 approx. watts.

* See under "Application."

As Suppressor Modulated R.F. Power Amplifier—Class C Telegraphy

Carrier Conditions to give 100% modulation.

D.C. Plate Voltage	..	450 volts max.
D.C. Screen Voltage	..	150 volts max.
D.C. Plate Current	..	25 milliamps max.
D.C. Grid Current	..	7.5 milliamps max.
Screen Input	..	4 watts max.
Plate Dissipation	..	10 watts max.

Typical Operation.

D.C. Plate Voltage	..	450	250 volts.
D.C. Screen Voltage	..	150	150 volts.
D.C. Grid Voltage	..	-90	-90 approx. volts.
D.C. Suppressor Voltage	..	-45	-20 approx. volts.
Peak R.F. Grid Voltage	..	130	130 approx. volts.
Peak A.F. Suppressor Voltage	..	65	30 approx. volts.
D.C. Plate Current	..	21	19 milliamps.
D.C. Grid Current	..	2.5	4.2 approx. milliamps.
D.C. Screen Current	..	17	22.5 milliamps.
Driving Power	..	0.5	1.0 approx. watts.
Carrier Power Output	..	2.5	1.2 approx. watts.

As Pentode Frequency Doubler

Typical Operation.

D.C. Plate Voltage	..	450 volts.
D.C. Screen Voltage	..	200 volts.
D.C. Grid Voltage	..	-120 approx. volts.
D.C. Plate Current	..	40 milliamps.
D.C. Screen Current	..	18 milliamps.
D.C. Grid Current	..	2 approx. milliamps.
Power Output (2nd Harmonic)	..	8 approx. watts.

As Triode Frequency Doubler

(G2 and G3 tied to G1 acting as control grid.)

Typical Operation.

D.C. Plate Voltage	..	450 volts.
D.C. Grid Voltage	..	-25 approx. volts.
D.C. Plate Current	..	40 milliamps.
D.C. Grid Current	..	18 approx. milliamps.
Power Output (2nd Harmonic)	..	8 approx. watts.

Installation

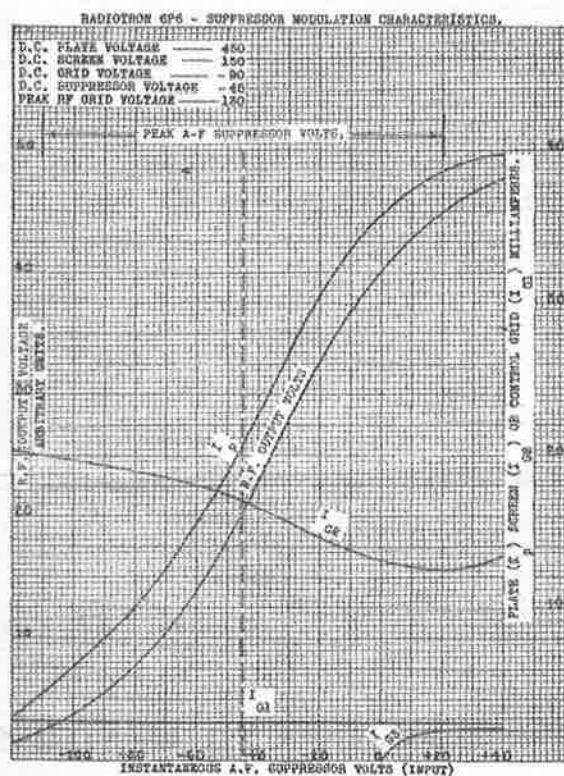
The heater of the 6P6 may be operated from A.C. or D.C. In circuits where the cathode operates at earth potential, it should be tied to the centre-tap of the heater supply for A.C. and the negative end of the heater for D.C. supply. In electron-coupled circuits, where the cathode is above earth potential, the heater should not be tied to the cathode but earthed. The peak voltage between heater and cathode should never exceed 90 volts.

In setting up any particular circuit the limitations of plate dissipation (difference between input and output), plate voltage, and plate current, should not be exceeded.

The screen voltage may be obtained from a separate source, a potentiometer, or through a series resistor in the plate supply. A potentiometer supply is recommended.

Suppressor voltage for the 6P6 may be obtained from a battery or potentiometer connected across the main D.C. high-tension supply. Both methods provide ample regulation for cases where the suppressor draws current.

Adequate shielding between input and output circuits is necessary. In cases where the shielding



is efficient, neutralisation of the grid-plate capacity will be found unnecessary.

Great care should be taken in making circuit adjustments, as under certain conditions high screen and plate currents may flow, which are particularly damaging to the screen. It is advisable to use a 3000 ohm. resistor in series with the common negative high-voltage lead during adjustments.

Application

As a Class C R.F. Amplifier or Oscillator for telegraphy, typical operating conditions and maximum ratings are shown above. Grid bias may be obtained from any of the conventional methods, viz., (i) From a grid leak of 50000 to 20000 ohms. depending on the available grid excitation, (ii) from a battery, (iii) Rectifier, (iv) a cathode bias resistor preferably variable, and suitably by-passed for both audio and radio frequencies. The cathode-bias method has the advantage of automatically protecting the valve when the grid excitation is accidentally removed or circuits are detuned. The grid leak method has the advantage of simplicity

and of automatically adjusting the bias in accordance with the excitation available. The grid bias voltage is not particularly critical for optimum results with this valve. The working D.C. grid current will vary accordingly.

A slight advantage will be obtained by operating the suppressor at a positive voltage up to 30 volts max. Reduced input to the screen results, together with a small increase in plate circuit efficiency.

As a suppressor modulated Class C R.F. amplifier, typical operating conditions will be found in the characteristic data. Grid bias may be obtained by the same methods as used for Class C R.F. amplifier service. Suppressor bias is best obtained from a potentiometer on the main D.C. high voltage supply. It may also be obtained from battery supply.

The operation of a suppressor-modulated self-excited oscillator differs slightly from that of an amplifier, and for a modulated oscillator it will be found that optimum results are obtained by reducing the suppressor D.C. bias and peak A.F. voltage to approx. two-thirds of the values shown under amplifier operating conditions. Frequency modulation in the case of a modulated oscillator is reduced to a practically negligible quantity.

It is considered desirable, in order to simplify the complete transmitter using suppressor-grid modulation, that only one stage be used in the modulator. A convenient triode is the 6A6 used with plates and grids tied together. Operated with 450 volts D.C. supply through a 50000 ohm plate load resistor, and cathode bias resistor of 600 ohms, this valve has a stage gain of approximately 30. Used with a carbon microphone and 10:1 transformer, the audio gain is ample. For operation from a pick-up a 3½:1 transformer may be included between the pick-up and the control grid of the 6A6.

As an R.F. frequency doubler, the 6P6 may be operated as a pentode or alternatively as a high-mu triode by connecting the three grids together

to form a control grid. Typical operating conditions are shown. The use of the valve under two different conditions as a frequency doubler, enables a selection to be made for optimum coupling to preceding and succeeding stages. Operation as control grid modulated amplifier is permissible

but is not considered advisable in view of the improved results obtained with suppressor grid modulation.

Other applications of the 6P6 are possible, and enquiry will be welcome along these lines.

Nett Price . . . 16/-

SPECIAL PRICE REDUCTION TO AMATEURS

Radiotron Acorn Valve Type 954 (Pentode) Now £2-0-0 Nett

Radiotron Acorn Valve Type 955 (Triode) Now £1-10-0 Nett