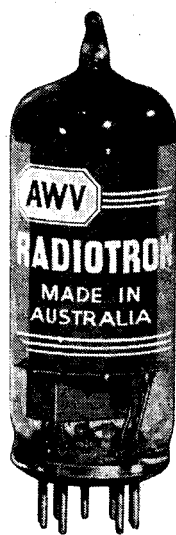


RADIOTRON 6BV7

MINIATURE DUO-DIODE POWER AMPLIFIER PENTODE *

APPLICATION

The Radiotron type 6BV7 is a nine-pin miniature duo-diode output pentode with a transconductance of 10,000 micromhos and a power output of 4 watts for 10% total harmonic distortion under recommended 250 volt operating conditions. The valve was designed primarily for use in low cost four valve receivers in which good performance is required with reduced plate and screen voltages and low cathode current. In this application with plate, screen and control grid voltages of 180, 180 and -4 volts respectively, Radiotron 6BV7 will deliver 2 watts output for 10% distortion with a plate current of only 20 mA.



Diodes

The location of the diodes in the output valve allows a very convenient layout of the conventional 4 valve straight or reflexed receiver and enables higher i-f gain to be obtained without excessive regeneration, or without neutralizing, than is possible when the diodes are located in the i-f amplifier valve.

In receivers with an a-f amplifier between the detector diode and the grid of the pentode section it is recommended that the diode connected to pin 6 be used for detection as this diode has the lower capacitance to pentode plate. In other types of receivers either diode may be used for detection.

Pentode

Grid resistor. The maximum permissible value of grid resistor for Radiotron 6BV7 under maximum dissipation conditions is 0.5 megohm for cathode bias operation and 0.1 megohm for fixed-bias operation. In conventional back-biased receivers in which the pentode is operated at maximum ratings the grid resistor should be reduced from 0.5 megohm in the ratio that the cathode current of the 6BV7 bears to the total current drawn by the receiver.

Larger values of grid leak may be used when the dissipation of the valve is reduced. For example, under the 180 volt conditions quoted above in a back-biased receiver in which at least half of the total B supply current is drawn by the output valve, the maximum permissible value of grid resistor is 1 megohm.

Grid stopper. The high transconductance of Radiotron 6BV7 provides good power sensitivity, and under 250 volt operating conditions an input of 0.25 volt r.m.s. gives 50 mW. output. Under 180 volt conditions an input of only 2.6 volts r.m.s. gives full rated output. In addition to its usefulness from the point of view of pure sensitivity, the high transconductance of Radiotron 6BV7 makes possible the use of a larger degree of negative feedback than would otherwise be possible. Even in the case of a four valve straight receiver a worthwhile degree of negative feedback can be applied to the output stage while still maintaining good overall sensitivity.

Because of the high transconductance of Radiotron 6BV7 a grid stopper should always be used, and a value of 5,000 ohms is recommended.

In four-valve straight receivers a large audio voltage appears on the diode, and with the volume control turned to minimum the amount of playthrough is proportional to the impedance between control grid and ground. For this reason, the grid stopper should not be too large — 5,000 ohms is as effective as 50,000 ohms in suppressing parasitic oscillation — nor should the grid coupling capacitor be too small. Under these conditions playthrough will be very low.

Use with low-level pick-ups.

When Radiotron 6BV7 is used as part of a high-gain pick-up amplifier, such as is required with some low-level pick-ups, it is desirable to arrange the radio-gramophone switching to remove the detection diode from the circuit in the high-gain pick-up position in order to remove the possibility of feedback through the diode circuit. As such switching is incorporated in most receivers to prevent interference with recorded items from radio programmes, this arrangement does not normally involve additional cost.

Ventilation.

The envelope of Radiotron 6BV7 becomes very hot in operation, and free circulation of air around the valve is necessary.

*Tentative data

RADIOTRON TYPE 6BV7 DUO-DIODE POWER AMPLIFIER PENTODE

GENERAL DATA

Heater, for Unipotential Cathode:			
Voltage (a.c. or d.c.)	6.3	volts
Current	0.8	amps.
Direct Interelectrode Capacitances:°			
Pentode Unit: Grid to Plate	0.5	μμF max.
Input	11.5	μμF
Output	9.5	μμF
Diode Units: Diode (pin 1) — Diode (pin 6)	0.01	μμF max.
Diode (pin 1) — Pentode Plate	0.7	μμF max.
Diode (pin 6) — Pentode Plate	0.3	μμF max.
Diode (pin 1) — Pentode Grid	0.1	μμF max.
Diode (pin 6) — Pentode Grid	0.1	μμF max.

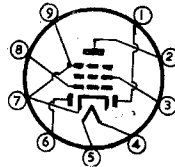
° With no external shield.

Mechanical:

Mounting Position	Any
Maximum Overall Length	2 $\frac{5}{8}$ "
Maximum Seated Length	2 $\frac{3}{8}$ "
Length, Base Seat to Bulb Top (excluding tip)	2" ± $\frac{3}{32}$ "
Maximum Diameter	$\frac{7}{8}$ "
Bulb	T-6 $\frac{1}{2}$
Base	Small-Button Noval 9-Pin

Base Connections for Bottom View:

- Pin 1 — Diode Plate
- Pin 2 — Pentode Plate
- Pin 3 — Pentode Grid No. 2
- Pin 4 — Heater
- Pin 5 — Heater



- Pin 6 — Diode Plate
- Pin 7 — Cathode and Pentode Grid No. 3
- Pin 8 — Pentode Grid No. 1
- Pin 9 — Cathode and Pentode Grid No. 3

PENTODE UNIT

A-F POWER AMPLIFIER—CLASS A₁

Maximum ratings, design-centre values:

Plate Voltage	250	max. volts
Grid No. 2 Voltage	250	max. volts
Plate Dissipation	10	max. watts
Grid No. 2 Dissipation	2	max. watts
Peak Heater-Cathode Voltage			
Heater negative with respect to cathode	90	max. volts
Heater positive with respect to cathode	90	max. volts

Typical operation and characteristics:

Plate Voltage	180	250	volts
Grid No. 2 (Screen) Voltage	180	250	volts
Grid No. 1 (Control-Grid) Voltage	-4	-5	volts
Peak A-F Grid No. 1 Voltage	4	5	volts
Zero-Sig. Plate Current	20	38	mA
Zero-Sig. Grid No. 2 Current	3.5	6.0	mA
Plate Resistance (Approx.)	130000	100000	ohms
Transconductance	8000	10000	umhos
Load Resistance	7000	7000	ohms
Max.-Sig. Total Harmonic Distortion	10	10	%
Max.-Sig. Power Output	2	4	watts

Maximum circuit values (for maximum rated conditions):

Grid No. 1 — Circuit Resistance:		
For fixed bias	0.1 megohm
For cathode bias	0.5 megohm
For back bias	See under Application

DIODE UNITS.

Maximum ratings, design-centre values:

Plate Current (for each diode)	1.0	max. mA.
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Diode considerations:

The two diode units are placed on opposite sides of, and parallel to the cathode, the sleeve of which is common also to the pentode unit.

The minimum diode current per plate with an applied d.c. voltage of 10 volts is 0.8 mA.