

THE CALCULATION OF LOAD RESISTANCE FOR POWER PENTODES.

There is a very simple formula for the calculation of the load resistance of power pentodes, including beam power tetrodes, which may be used when the published data may not be available. This formula involves only two factors, namely the plate voltage and the plate current.

The formula is:

$$\text{Load Resistance} = \frac{E_B \times 1,000 \text{ ohms.}}{I_B}$$

where E_B is the plate voltage in volts, and I_B is the plate current in milliamperes.

For example, type 6F6-G with 250 volts on plate and screen draws a plate current of 34 mA. The load resistance according to the formula would be 250 volts multiplied by 1,000 and divided by 34, this being equal to 7,350 ohms. This is slightly higher than the published load resistance of 7,000 ohms and in most cases it will be found that the formula gives a slightly higher value of load resistance. It is sufficiently close, however, for all practical purposes, but where it comes out to an odd figure it is suggested that the nearest lower round figure be selected.

The same principle may be used for beam power tetrodes, such as types 6V6-G or 6L6-G, although in the latter case owing to its special characteristics the calculated values should be reduced by approximately 25%.

This approximate formula may also be applied to all battery pentodes and will be found to be reasonably close in all cases. The basis of this approximate formula is theoretically sound and may readily be derived by anyone sufficiently interested to draw a graph of the load line of an ideal pentode.

RADIOTRON CATHODE RAY TUBES NOW AVAILABLE

A wide range of cathode ray tubes is now available, covering 1in., 2in., 3in. and 5in. screen diameters and various types of fluorescent screen materials and constructions. The complete list includes type 913 (1in.), type 902 (2in.), type 906-P1 (3in.) and a wide range of 5in. types 904, 905, 907, 1801, 5BP1/1802P1 and 1802-P4.

In Issue 2 of Radiotronics Digest some technical details were given on Radiotron type 913 cathode ray tube. This is now available in large quantities from stock, as indicated above.

RADIOTRON DESIGNER'S HANDBOOK

It is not expected that any further reprints will be made of the third edition of the Radiotron Designer's Handbook and those who do not already possess a copy are reminded that they will need to place their orders before present stocks become exhausted.

The Radiotron Designer's Handbook is obtainable directly from Amalgamated Wireless Valve Co. Pty. Ltd., 47 York Street, Sydney, at a price of 6/- (including sales tax), or 6/4 posted.

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RADIOTRONICS DIGEST

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Exceptional Performance ★

The following is an extract from a letter from an R.A.A.F. Officer which speaks for itself.

"It may be of interest to your company to know that some of the valves produced by your company have given really remarkable service and have stood up to a battering which one would normally expect to completely destroy the item.

"For instance, a set of valves recovered from an ATS AR8 combination which had been installed in an aircraft which burnt and subsequently blew up with full bomb load had about 30% survival, one 6V6-G had been so hot that the base had entirely gone and the envelope had collapsed to such an extent that it was in contact with the anode; when this valve was tested it showed 100% emission and was later used in a ground installation where it gave normal service.

"My own experience with your products working under conditions which are far from ideal has convinced me that they are equal to the world's best."

MODIFICATIONS TO RADIOTRON TYPE 6U7-G AND 6D6 VALVES

As indicated on the data sheet for type 6U7-G (sheet 1 dated December, 1944), the internal screen in type 6U7-G is connected to pin 5 to which is also connected the suppressor. This arrangement was adopted purposely in order to enable this type of valve to be used in certain circuits in which the cathode is above earth potential. No effect is found in normal usage since the suppressor is usually connected to the cathode at the socket and the internal screen is therefore at the same potential as both cathode and suppressor.

Type 6U7-G valves supplied against Army, Air Force or Navy Orders, are tested to JAN-1A specifications which call for connection of the internal screen to the cathode. There is, therefore, a difference between the commercial 6U7-G valves and those supplied to the services and branded JAN.

Commercial type 6D6 valves will have the same connections as type 6U7-G and the data sheet for this type (dated October, 1940) will shortly be amended to agree with this change.

SUPPRESSION OF PARASITIC OSCILLATION TYPE 807 VALVES

It has been found that type 807, which is somewhat inclined to give trouble with parasitic oscillation under certain conditions, may be made to give satisfactory operation by the incorporation of a small resistor and by-pass condenser in the screen circuit, in the form of a suppressor resistance.

A resistance of 100 ohms has been found satisfactory when connected directly to the screen terminal of the valve, with a by-pass condenser having a capacitance of 0.01 uF. taken from the end of the suppressor resistance remote from the screen, directly to earth. The resistor should be non-inductive and I.R.C. type F with a maximum dissipation of 2 watts has been found satisfactory. The by-pass condenser should be of the mica type.

RADIOTRONICS TO RECOMMENCE PUBLICATION

It is planned to recommence the publication of Radiotronics Technical Bulletins at the beginning of 1946. The first issue is expected to be available in February, 1946, and subsequent issues at intervals of two months thereafter.

All those who are already on the mailing list and are therefore receiving Radiotronics Digest will continue to receive the full issues for 1946 without the payment of any further subscription. Those who are not yet on the mailing list should apply as early as possible, sending in the sum of 2/- for the bulletins plus 6d. for the cover or 2/6 in all for the period ending December, 1946.

THE SERVICING OF AC/DC RECEIVERS

Owing to the shortage of power output and rectifier valves for AC/DC and DC receivers, difficulties have been experienced in servicing such receivers. While it is anticipated that a limited number of these valves will become available in the near future, it is thought that the following suggestions may prove helpful in meeting the situation until sufficient valves become available to supply the full demand.

If a rectifier fails in an AC/DC receiver used on an AC supply, it is preferable to convert the set to AC, with conventional power valve, rectifier and transformer.

If a rectifier fails in an AC/DC receiver used on a DC supply, it is suggested that the rectifier be short circuited but that provision be made to prevent the plug from being inserted into the socket in the reverse direction. This could be done by means of a three pin or other unidirectional plug. If the heater of the rectifier valve has become open circuited it would be wise to insert a resistor to take up the same voltage drop as the heater of the valve.

If the power valve fails in an AC/DC or DC receiver, it is sometimes possible to use in its place, a small RF pentode or triode valve which has a 6.3 volt 0.3 amp. heater. Although the power output obtainable under these conditions is limited, the expedient is well worth while if it is the only alternative to putting the set out of commission. Type 6J7-G or 6C6, or any similar RF pentode may be used as power pentodes in accordance with the data given on the Radiotron Data Sheet for type 6J7-G dated May, 1945. The power output obtained with the standard load resistance may be sufficient for the purpose, but for the best results the output transformer may be replaced by one having an impedance as high as is obtainable—say from 15,000 to 25,000 ohms.

A general purpose triode such as type 6J5-G or 6C5-G may also be used as an emergency power valve, although the power output may be lower than that for an equivalent pentode. The bias should be adjusted to give a plate current of the order of 6 or 7 mA. and the load resistance should be between 15,000 and 25,000 ohms if possible.

Large quantities of Radiotron type 302 barretters are on order, but should the need for one occur before the first shipment arrives, it will be necessary to replace it by a fixed resistor capable of carrying the current of 0.3 amp. at the normal operating voltage.

DOUBLE BARRELLED TYPE NUMBERS

Some uncertainty appears to exist regarding the meaning of the double barrelled type numbers, such as type 1B5/25S. The meaning is very simple and should be understood by all those handling valves.

The stroke in the middle of the type number means "superseding and replacing" so that type 1B5/25S means, "Type 1B5, superseding and replacing the earlier type 25S, which is no longer being manufactured."

Similarly, type 6U5/6G5 indicates that it is type 6U5 superseding and replacing the earlier type 6G5, which is no longer being manufactured.

Another example is type 866A/866, which indicates a new construction of type 866A, superseding and replacing type 866. In this particular case, the new model differs from the earlier type 866A, which was not capable of being used to replace type 866 under all circumstances.

At a later date, the second half of the double barrelled type number will be dropped, leaving the first half only. This has already been done in the case of 6V6GT, which supersedes and replaces the earlier type 6V6G which is no longer being manufactured, although certain stocks of type 6V6G may still be held, and it may be some months before the GT valve completely supersedes the earlier G type.