KBC 1 Double-diode triode

The KBC 1 is a directly-heated double-diode triode. This combination of triode with two diodes promotes a considerable saving in filament current, this being a matter of some importance in battery receivers.

This valve can be employed to advantage in "straight" circuits or in superheterodyne receivers; the triode unit may be used also as a driver in conjunction with the Class B output amplifier KDD 1, or as pre-amplifier for the output pentode KL 4.

The diode located at the negative end of the filament should be used as detector and the other diode, at the positive end, for the delayed A.G.C. In Fig. 2, the diode situated at the end of the filament marked f_1 is shown as d_1 and the other, at the extremity f_2, as d_2. If the filament extremity f_1 is positive, diode d_2 is employed as detector; otherwise weak signals are not properly rectified. The loading resistor on the diode should preferably be connected to the positive, not to the negative, end of the filament, as this gives a better detection characteristic.

The second diode is approximately 2 V negative with respect to the positive extremity of the filament, thus providing a similar amount of delay voltage; if a greater delay is desired, this can be obtained by the use of a special circuit (see Chapter XXV). The diode unit is separated from the triode section by a screen, which effectively prevents any coupling between the two.

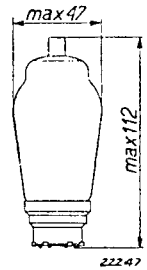

Fig. 1
Dimensions in mm

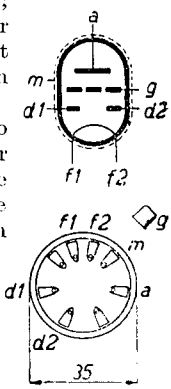

Fig. 2
Arrangement of electrodes and base connections

FILAMENT RATINGS

Heating: direct, by battery; parallel supply.

Filament voltage	V_f	= 2 V
Filament current	I_f	= 0.115 A

CAPACITANCES

Diode section:	C_{d_1}	= 2.7 $\mu\mu$F	Triode section:	C_{ag}	= 3.1 $\mu\mu$F
	C_{d_2}	= 2.5 $\mu\mu$F		C_a	= 6.5 $\mu\mu$F
	$C_{d_1d_2}$	< 0.5 $\mu\mu$F		C_g	= 3.0 $\mu\mu$F
	C_{d_1g}	< 0.003 $\mu\mu$F			
	C_{d_2g}	< 0.003 $\mu\mu$F			

STATIC DATA OF THE TRIODE SECTION

Anode voltage	V_a = 90	135 V
Grid bias	V_g = —3.4	—4.5 V
Anode current	I_a = 1	2.5 mA
Amplification factor	μ = 16	16
Mutual conductance	S = 0.7	1 mA/V
Internal resistance	R_i = 23,000	16,000 ohms

KBC 1

MAXIMUM RATINGS

Triode section:	V_a	= max. 150 V
	W_a	= max. 0.6 W
	I_k	= max. 6 mA
	V_g (I_g = + 0.3 μA)	= max. —0.2 V
	R_g	= max. 3 M ohms
Diode section:		
Voltage on diode (peak value) .	$V_{d1} = V_{d2}$	= max. 125 V
Diode current.	$I_{d1} = I_{d2}$	= max. 0.2 mA
Diode voltage at diode current start	(I_{d2} = + 0.3 μA) V_{d2}	= max. —0.4 V

When the triode section is to be employed as a resistance-coupled A.F. amplifier. the necessary data may be obtained from the following table:

TABLE

KBC 1 used as a resistance-coupled A.F. amplifier

Battery voltage V_a (V)	Coupling resistor R_a (M ohm)	Anode current I_a (mA)	Grid bias V_g (V)	Output voltage V_o (V_{eff})	Distortion d (%)	Stage gain $\frac{V_o}{V_i}$
135	0.2	0.35	—2.0	5 8	0.7 1.2	12.5
90	0.2	0.19	—2.0	3 5	0.8 1.3	11
135	0.1	0.69	—2.0	5 8	0.7 1.2	12
90	0.1	0.36	—2.0	3 5	0.8 1.3	11
135	0.05	1.25	—2.0	5 8	0.8 1.3	11
90	0.05	0.60	—2.0	3 5	1.0 1.6	10

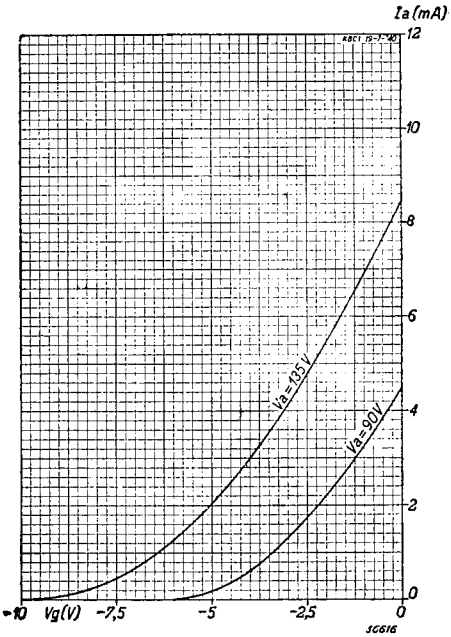

Fig. 3
Ia/Vg characteristics for the triode section of the KBC 1.

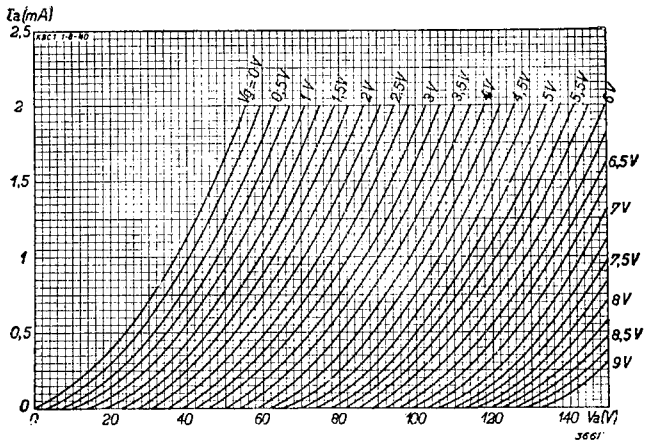

Fig. 4
Anode current of the triode section of the KBC 1 as a function of the anode voltage with grid bias as parameter.