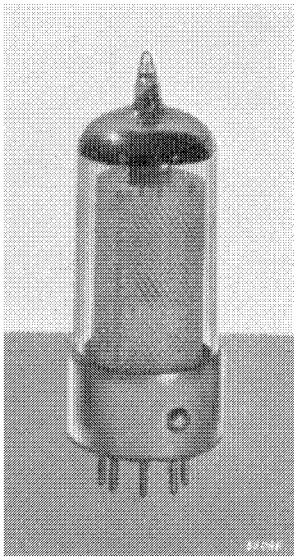
UBC 41 Double diode - triode



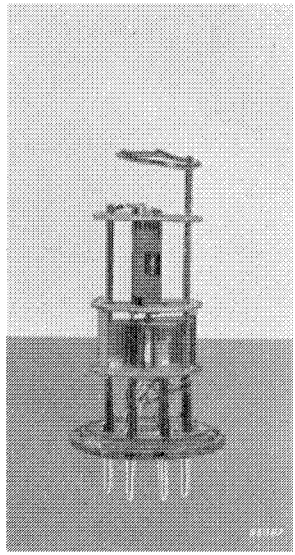


Fig. 1
The UBC 41, showing the electrode system (approximately actual size).

The UBC 41 is a double diode-triode for A.C./D.C. receivers with 100 mA heater circuits. The diode system is intended for detection and A.G.C., leaving the triode system for A.F. amplification.
Since, apart from the heater, the UBC 41 is identical with the EBC 41, reference should be made to the description of the latter valve for further particulars.
It should be noted that, in order to reduce hum, it is advisable so to connect the heater in the heater circuit of the receiver that pin number 1 (see Fig. 2) is as close as possible to the earthed point.

TECHNICAL DATA OF THE DOUBLE DIODE-TRIODE UBC 41

Heater data

Heating: indirect, A.C. or D.C., series feed

Heater current	I_f	=	100 mA
Heater voltage	V_f	=	14 V

UBC 41

Capacitances (cold valve)

Triode section

Input capacitance	C_g	=	2.7 pF
Output capacitance . .	C_a	=	1.7 pF
Anode - control grid . . .	C_{ag}	=	1.5 pF
Heater - control grid . . .	C_{gf}	<	0.05 pF

Diode section

Input capacitance, diode 1 . .	C_{d1}	=	0.8 pF
Input capacitance, diode 2 . .	C_{d2}	=	0.7 pF
Between the diode anodes . .	C_{d1d2}	<	0.3 pF
Between heater and anode of diode 1	C_{d1f}	<	0.1 pF
Between heater and anode of diode 2	C_{d2f}	<	0.05 pF

Between diode and triode sections

Between control grid and anode of diode 1	C_{d1g}	<	0.007 pF
Between control grid and anode of diode 2	C_{d2g}	<	0.03 pF
Between triode anode and anode of diode 1	C_{d1a}	<	0.01 pF
Between triode anode and anode of diode 2	C_{d2a}	<	0.01 pF

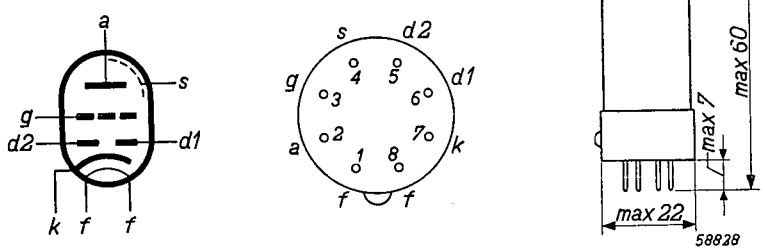


Fig. 2
Electrode arrangement, electrode connections and dimensions in mm of the UBC 41.

Typical characteristics of the triode section

Anode voltage	V_a	=	100	170 V
Grid bias	V_g	=	—1.0	—1.55 V
Anode current	I_a	=	0.8	1.5 mA
Mutual conductance . . .	S	=	1.4	1.65 mA/V
Amplification factor	μ	=	70	70
Internal resistance	R_i	=	50	42 kΩ

Operating characteristics of the triode section used as A.F. amplifier (for particulars of this circuit regarding microphony see description of the EBC 41)

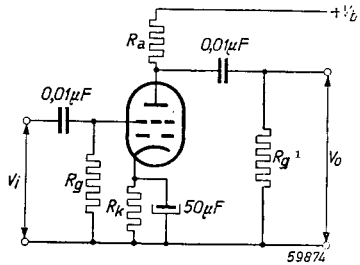


Fig. 3
The UBC 41 used as A.F. amplifier.

V_b (V)	R_a (MΩ)	R_k (kΩ)	R_g (MΩ)	R_g' (MΩ)	I_a (mA)	V_o/V_i	Distortion (%) at V_o =		
							3 V_{RMS}	5 V_{RMS}	8 V_{RMS}
170	0.22	5.6	1	0.68	0.28	44	1.1	1.3	1.85
100	0.22	5.6	1	0.68	0.18	41	1.4	1.9	—
170	0.1	3.9	1	0.33	0.45	37	1.1	1.7	2.6
100	0.1	3.9	1	0.33	0.28	34	2.0	3.5	—
170	0.22	0	10	0.68	0.46	48	0.95	1.1	1.3
100	0.22	0	10	0.68	0.21	41	1.45	2.0	—
170	0.1	0	10	0.33	0.82	42	0.75	1.0	1.2
100	0.1	0	10	0.33	0.35	35	1.6	2.8	—

UBC 41

Limiting values of the triode section

Anode voltage, cut-off condition	V_{a_o}	= max.	550	V
Anode voltage	V_a	= max.	250	V
Anode dissipation	W_a	= max.	0.5	W
Cathode current	I_k	= max.	5	mA
Grid current starting point . .	$V_g(I_g = +0.3\ \mu A)$	= max.	—1.3	V
External resistance between grid and cathode	R_g	= max.	3	MΩ [1]
Voltage between heater and cathode	V_{fk}	= max.	150	V
External resistance between heater and cathode	R_{fk}	= max.	20	kΩ

Limiting values of the diode section

Peak inverse voltage between	$V_{d1\ inv\ p}$	= max.	350	V
cathode and diode anodes .	$V_{d2\ inv\ p}$	= max.	350	V
Diode current	I_{d1}	= max.	0.8	mA
	I_{d2}	= max.	0.8	mA
Peak diode current . . .	I_{d1p}	= max.	5	mA
	I_{d2p}	= max.	5	mA
Diode current starting point .	$V_{d1}(I_{d1} = +0.3\mu A)$	= max.	—1.3	V
	$V_{d2}(I_{d2} = +0.3\mu A)$	= max.	—1.3	V

[1]) This value is applicable where grid bias is derived from a cathode resistor. If the grid leak is the only source of the bias (i.e. no cathode resistor or battery source), the maximum value for R_g is 22 MΩ.

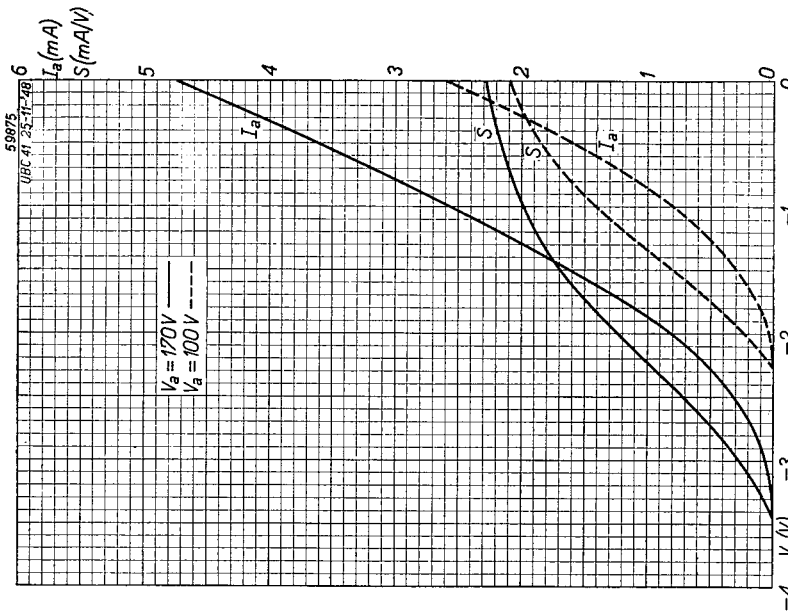


Fig. 4
Anode current (I_a) and mutual conductance (S) of the UBC 41 as functions of the grid bias (V_g) with anode voltages of 100 V and 170 V.

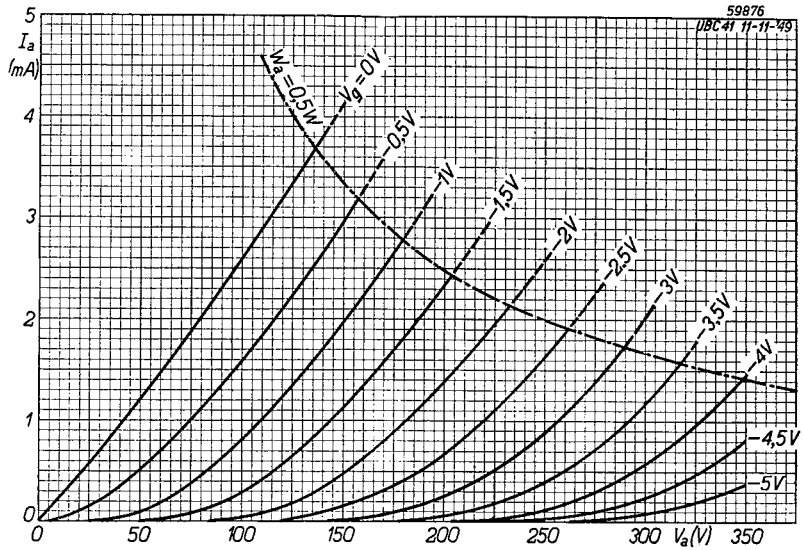


Fig. 5
I_a/V_a characteristics of the UBC 41. The dot-dash line indicates the maximum permissible anode dissipation (W_a=0.5W).

For the *diode characteristics* see Figs. 6 and 7 in the description of the EBC 41.